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(54) Title: MEDIA MANAGEMENT AND TRACKING

(57) Abstract: A system is described for enabling a user to listen to songs on a network- enabled device, including an embedded receiver for receiving at least one song list, and for receiving music streamed over a wireless network, list navigation software, for navigating the at least one song list and selecting a desired song therefrom, using a keypad communicatively coupled with the network-enabled device, an embedded transmitter for transmitting a song selection to a tracking server, and an embedded audio player, for playing the music streamed to the network-enabled device over the wireless network, a tracking server, including a data store including at least one song list, a receiver for receiving a song selection from said network- enabled device, the song selection comprising an ID for a selected song, and a transmitter for transmitting the at least one song list to the network-enabled device, and for transmitting the received song selection to a media server, and a media server, including a data store including audio files for the songs listed in the song list, an audio streamer, a receiver for receiving an instruction from said tracking server to transmit the selected song to the network-enabled device, and a transmitter for streaming the selected song to the network-enabled device. A method and a computer-readable storage medium are also described.

MEDIA MANAGEMENT AND TRACKING

CROSS REFERENCES TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of assignee's pending application U.S. Serial No. 11/261,687, filed on October 28, 2005, entitled "*Method and System for Tracking and Managing Rights for Digital Music*," which is a continuation-in-part of assignee's application U.S. Serial No. 10/893,473, filed on July 16, 2004, entitled "*Method and System for Managing Rights for Digital Music*," which is a continuation-in-part of assignee's pending application U.S. Serial No. 10/829,581, filed on April 21, 2004, entitled "*Portable Music Player and Transmitter*," which is a continuation-in-part of assignee's pending application U.S. Serial No. 10/336,443, filed on January 2, 2003, entitled "*Automatic Digital Music Library Builder*."

FIELD

[0002] Embodiments of the present invention relate to rights management for use and transfer of digital music recordings.

BACKGROUND

[0003] Consumers are generally aware to some extent of copyright laws concerning digital recordings, but there are no automatic features in place to assist consumers in abiding with them. For example, a consumer who purchases a song on a CD, or through a subscription with an Internet music sharing service such as Napster, generally does not know if he is permitted to make personal copies of the song for himself, on one or more of his computers, or on one or more CDs, or on one or more MP3 players.

[0004] Digital rights management (DRM) technology addresses this concern by encapsulating songs within a DRM wrapper. The DRM wrapper, which is generally

encrypted, specifies whether or not a specific device has the necessary rights to play a specific song. Hardware or software within the player then enables or disables playing of the song accordingly. Generally, DRM systems only enable playing of a song on a device if the owner of the device has purchased a license for the song. If the owner of the device has not purchased a license for the song and wishes to do so, and if the device is connected via a computer network to a licensing authority, referred to as a "clearing house," then the owner may purchase a license from the clearing house, in which case the DRM wrapper is updated so as to reflect current ownership.

[0005] A disconnected device, however, generally cannot purchase such a license unless the disconnected device connects with a connected device that can access a clearing house. As such, the disconnected device cannot play a song that is not licensed by the owner of the device, when the owner is not located at a point of connection.

[0006] For marketing purposes, it would be beneficial if disconnected devices could play trial versions of songs that are not licensed by the device owners, and if such trial versions could be copied as trial versions from one disconnected device to another. The owners of the disconnected devices could then listen to the trial versions of the songs and afterwards, if they wish to purchase licenses to the songs, could do so by connecting their disconnected devices to a connected device, at their convenience, and purchasing licenses from a clearing house.

[0007] It would thus be beneficial if a merchandising system was in place to manage digital rights for songs that are obtained as trial versions, copied from device to device, and subsequently converted to fully licensed versions.

[0008] It would also be beneficial to track the history of license purchases within such a merchandising system, as trial versions of songs are copied from device to device through a sharing chain of friends, some of whom eventually purchase licenses to the trial versions. In particular, tracking of licensing history would enable

a profit-sharing arrangement whereby a portion of the payment paid by a person along the sharing chain is allotted to the original clearing house or vendor from which a song was licensed.

[0009] Additionally, it would be beneficial for an owner of digital music to be able to listen to his music on networked devices that do not store digital copies of the music itself. Such benefit would enable the owner to access his music while away from his home, essentially anywhere. The owner could then listen to his music on cell phones, networked portable media players and public access devices such as media center devices in hotel rooms, whether or not such devices belong to the owner.

SUMMARY OF THE DESCRIPTION

[0010] Embodiments of the present invention concern a configurable method and system for managing copyright privileges when a digital work is copied or streamed from one device to another, and for allowing the owner of a digital work to enjoy the work on a plurality of devices, inside the owner's home and outside, whether or not the devices belong to the owner. Embodiments of the present invention apply to many forms of digital copyright works, including inter alia songs, movies and pictures. The ensuing description refers primarily to digital songs, for the sake of clarity.

[0011] In a general setting, digital songs are (i) acquired from external sources, including inter alia Internet music services such as iTunes® and Napster®, CDs and other recording media, music kiosks and broadcast music stations such as cable and satellite stations; and thereafter (ii) copied between digital audio recorders and digital audio players. Transfer of songs may be likened in some respects to a virtual water distribution system with nodes and conduits, wherein the nodes store water and the conduits transmit water from one node to another. External nodes represent music sources such as record stores, kiosks and Internet music services; and internal nodes represent audio recorders and players.

[0012] Within this paradigm of water distribution, digital rights management concerns controlling valves that restrict the flow of water within the pipes, and controlling access to the water in the nodes.

[0013] In an embodiment of the present invention,

- digital audio devices may be registered with one another; and
- songs stored within recorders and players are labeled as being "Purchased," "Recorded" or "Try & Buy."

[0014] For one embodiment, digital audio players are registered with either zero or one digital audio recorder. In other words, a digital player cannot be registered

with more than one recorder, but one digital recorder can have multiple digital players registered therewith.

[0015] For one embodiment, the label of a song is used to identify copyrights associated therewith. The Try & Buy label is used for promotional or trial versions of songs, which generally include an expiration event, upon occurrence of which the song "evaporates"; i.e., can no longer be played in its entirety. For example, a listener may be enabled to play a Try & Buy song for a limited number of times, or for a limited time span. After the song has expired, it cannot be played further. However, the listener can generally purchase the song through an appropriate device, including inter alia a kiosk, a cellular phone, or a PC computer connected to the Internet.

[0016] For one embodiment of the invention, copyright management is achieved by (i) restricting a song from being copied from a source device to a target device; and (ii) specifying the way a song is labeled within a target device when the song is copied from a source device to the target device -- based on the source device, the target device, the label of the song in the source device, and based on whether or not the source and target device are commonly registered.

[0017] Further, in an alternate embodiment of the invention, copyright management may restrict the number of copies permitted to be made for a song resident on a source device. For example, when a recorder is used to copy songs to a plurality of players, up to three copies of a song may be permitted.

[0018] Thus it may be appreciated that embodiments of the invention enable audio device manufacturers to configure a flexible logic for digital rights management in accordance with legal requirements in their respective locales. Various such configurations are described in the detailed description hereinbelow.

[0019] Embodiments of the present invention may be implemented in conjunction with third-party digital rights management systems, in order to comply with third-party DRM rules and in order to ensure backward compatibility with third-party

players. As such, embodiments of the present invention provide an enhancement to conventional DRM systems, within conventional architectures.

[0020] Embodiments of the present invention may also be used advantageously for tracking usage and merchandising. Specifically, a first user purchases a license to a digital work. Subsequently the digital work is copied from device to device along a sharing chain of friends, one friend sharing with the next friend. The shared copies are Try & Buy copies, which can only be accessed in limited ways. Some or all of the friends along the chain may eventually purchase their copy of the digital work, converting it from a Try & Buy copy to an owned copy. Using an embodiment of the present invention, when such a friend purchases a license to convert a shared Try & Buy copy of the digital work into an owned copy, information as to the original source of purchase as well as the friend's usage is tracked. This information can be used inter alia to allot a portion of the payment received from the friend to the original source of purchase, and to aggregate usage and purchase statistics.

[0021] In distinction from embodiments of the present invention, prior art digital rights managers do not include the feature of adapting labels from source label to target label when a song is copied from a source device to a target device. One such prior art digital rights manager is Microsoft Corporation's Windows Media Rights Manager, which implements digital rights by encrypting audio files using keys, and packaging the files with key IDs. In order to play the audio files, a user obtains a license, which contains a key to decrypt the file.

[0022] Another such prior art digital rights manager is Apple Corporation's iTunes rights manager, which registers iPod music players with computers, so that an iPod cannot download an MP3 song from a computer that it is not registered with.

[0023] Embodiments of the present invention may be used for enabling a mobile user who is away from home to access and navigate playlists of songs stored on his home PC or other home media device, using his cellular telephone, and to select

songs for listening. The selected songs are then streamed to an embedded player in the user's cellular telephone upon demand, from one or more media servers.

[0024] Embodiments of the present invention may also be used for programmed advertising. As part of an advertising campaign, a sponsor distributes free portable media players, or free songs, to a targeted set of users. In addition, audio files for advertisements are also distributed to the users' media players as part of the campaign, and programmed for automatic playback when conditions specified by the sponsor are satisfied for the players. Embodiments of the present invention provide a flexible interface for distributing songs to specific players, and for associating one or more programmed advertisements with individual songs, with groups of songs, or with specific players.

[0025] There is thus provided in accordance with an embodiment of the present invention a system for enabling a user to listen to songs on a network-enabled device, including a network-enabled device, including an embedded receiver for receiving at least one song list, and for receiving music streamed over a wireless network, list navigation software, for navigating the at least one song list and selecting a desired song therefrom, using a keypad communicatively coupled with the network-enabled device, an embedded transmitter for transmitting a song selection to a tracking server, and an embedded audio player, for playing the music streamed to the network-enabled device over the wireless network, a tracking server, including a data store including at least one song list, a receiver for receiving a song selection from said network-enabled device, the song selection comprising an ID for a selected song, and a transmitter for transmitting the at least one song list to the network-enabled device, and for transmitting the received song selection to a media server, and a media server, including a data store including audio files for the songs listed in the song list, an audio streamer, a receiver for receiving an instruction from said tracking server to transmit the selected song to the network-enabled

device, and a transmitter for streaming the selected song to the network-enabled device.

[0026] There is further provided in accordance with an embodiment of the present invention a method for a network-enabled device to play songs, including transmitting a play request from a network-enabled device to a tracking server, receiving at least one song list from the tracking server, providing a user interface that enables a user to navigate the at least one song list and to select a desired song, using a keypad communicatively coupled with the network-enabled device, transmitting an ID of the selected song to the tracking server, receiving streamed audio data for the selected song from a media server, and playing the streamed audio data on an audio player embedded in the network-enabled device.

[0027] There is yet further provided in accordance with an embodiment of the present invention a method for a tracking server to cause music to be streamed to a network-enabled device, including receiving a play request from a network-enabled device, sending at least one song list to the network-enabled device, in response to the received play request, receiving a selection request from the network-enabled device with an ID for a selected song, and sending an instruction to a media server to stream the selected song to the network-enabled device.

[0028] There is moreover provided in accordance with an embodiment of the present invention a system for enabling a user to listen to songs on a network-enabled device, including a network-enabled device, including an embedded receiver for receiving music streamed over a wireless network, list navigation software, for navigating at least one song list and selecting a desired song therefrom, using a keypad communicatively coupled with the network-enabled device, an embedded transmitter for transmitting the song selection to a tracking server, and an embedded audio player, for playing the music streamed to the network-enabled device over the wireless network, a tracking server, including a receiver for receiving a song selection from the network-enabled device, the song

selection comprising an ID for a selected song, and a transmitter for transmitting the received song selection to a media server, and a media server, including a data store including audio files for the songs listed in the song list, an audio streamer, a receiver for receiving an instruction from said tracking server to transmit the selected song to the network-enabled device, and a transmitter for streaming the selected song to the network-enabled device.

[0029] There is additionally provided in accordance with an embodiment of the present invention a method for a network-enabled device to play songs, including providing a user interface that enables a user to navigate at least one song list and to select a desired song, using a keypad communicatively coupled with a network-enabled device, transmitting an ID of the selected song to a tracking server, receiving streamed audio data for the selected song from a media server, and playing the streamed audio data on an audio player embedded in the network-enabled device.

[0030] There is further provided in accordance with an embodiment of the present invention a method for a tracking server to cause music to be streamed to a network-enabled device, including receiving a selection request from a network-enabled device with an ID for a selected song, and sending an instruction to a media server to stream the selected song to the network-enabled device.

[0031] There is yet further provided in accordance with an embodiment of the present invention a system for deploying advertisements on portable music players, including a portable music player, including a database of audio advertisements and playback rules therefor, wherein playback rules are used to govern when to play advertisements, an ad updater for periodically receiving advertisements and playback rules, and an ad scheduler for scheduling playback of advertisements in accordance with their playback rules, a host device that is periodically communicatively coupled with the portable music player, including a database of audio advertisements and playback rules therefore, an ad provisioner for transferring

ads and playback rules to the portable music player, when the portable music player is communicatively coupled with the host device, an ad updater for receiving advertisements and playback rules from time to time, and an advertising server that is communicatively coupled with the host device, including a database of information about advertisers and their advertising campaigns, and for storing audio advertisements, distribution rules therefor and playback rules therefore, an ad provisioner for transferring ads and playback rules to the host device, and a web interface for receiving advertisements and playback rules for an advertising campaign, from an advertiser's computer.

[0032] There is moreover provided in accordance with an embodiment of the present invention a portable music player, including a database of audio advertisements and playback rules therefor, wherein the playback rules are used to govern when to play the advertisements, and wherein each one of the playback rules includes a condition and an advertisement, or a condition and a plurality of advertisements, an ad updater for receiving advertisements and playback rules related to an advertising campaign, an ad scheduler for periodically evaluating the playback rule conditions, and for scheduling playback of the advertisements in accordance with the playback rules, and a tracking engine for maintaining a history of advertisements played, and for periodically uploading the history to a server computer and clearing the history thereafter.

[0033] There is additionally provided in accordance with an embodiment of the present invention a method for deploying advertisements within portable music players, including uploading a plurality of audio advertisements and a plurality of playback rules to a server computer, the plurality of advertisements and the plurality of playback rules being designated for deployment in a plurality of portable music players, wherein playback rules are used to govern when to play advertisements, transmitting the plurality of advertisements and the plurality of playback rules to a host device into which at least one of the plurality of portable music players is

periodically docked, transmitting at least one advertisement and at least one playback rule from the host device to each of at least one portable music players, when such portable music player is docked in the host device, periodically evaluating at least one playback rule, in each of the plurality of portable music players, and playing at least one advertisement according to the periodically evaluating, in each of the plurality of portable music players.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] Embodiments of the present invention will be more fully understood and appreciated from the following detailed description, taken in conjunction with the drawings in which like references indicate similar elements and in which:

[0035] **FIG. 1** is a front view of a digital archive, referred to as a "Nest," in accordance with an embodiment of the present invention;

[0036] **FIG. 2** is a side view of a music player, referred to as an "Egg", in accordance with an embodiment of the present invention;

[0037] **FIG. 3** is a bottom view of the music player of **FIG. 2**, in accordance with an embodiment of the present invention;

[0038] **FIG. 4** is an illustration of a user interface for copying songs from the digital archive of **FIG. 1** into the music player of **FIG. 2**, in accordance with an embodiment of the present invention;

[0039] **FIG. 5** is a simplified block diagram of a tracking system used to stream a customer's music to the customer's cell phone, in accordance with an embodiment of the present invention;

[0040] **FIG. 6** is a simplified flowchart of a method for streaming a customer's music to the customer's cell phone, in accordance with an embodiment of the present invention;

[0041] **FIG. 7** is a simplified flowchart of a method for "checking-out" songs from the digital archive of **FIG. 1** to the music player of **FIG. 2**, in accordance with an embodiment of the present invention;

[0042] **FIG. 8** is a simplified flowchart of a method for "checking-in" songs from the music player of **FIG. 2** to the digital archive of **FIG. 1**, in accordance with an embodiment of the present invention;

[0043] **FIG. 9** is a simplified flowchart of a method for tracking the number of times the same song is broadcast while the digital archive of **FIG 1** is recording music, in accordance with an embodiment of the present invention;

[0044] **FIG. 10** is a simplified block diagram of a digital rights management system, in accordance with an embodiment of the present invention;

[0045] **FIG. 11** is a simplified flow chart for a digital rights management method, in accordance with an embodiment of the present invention;

[0046] **FIGS. 12A** and **12B** are simplified illustrations of a first consumer use case of acquiring a song in accordance with an embodiment of the present invention;

[0047] **FIGS. 13A** and **13B** are simplified illustrations of a second consumer use case of acquiring a song in accordance with an embodiment of the present invention;

[0048] **FIGS. 14A**, **14B** and **14C** are simplified illustrations of a third consumer use case of acquiring a song in accordance with an embodiment of the present invention;

[0049] **FIG. 15** is a simplified illustration of a workflow for implementing digital rights management in conjunction with a third-party DRM system, in accordance with an embodiment of the present invention;

[0050] **FIG. 16** is a simplified workflow for usage and merchandising tracking in accordance with an embodiment of the present invention;

[0051] **FIG. 17**, which is a simplified block diagram of a system for deployment of advertisements in customer Egg players, in accordance with an embodiment of the present invention; and

[0052] **FIG. 18** is a simplified flowchart of a method for scheduling advertisements according to evaluation of playback rules, in accordance with an embodiment of the present invention.

[0053] The following definitions are employed throughout the specification.

EGG -- a small portable digital music player, such as the player illustrated in **FIGS. 2** and **3**; an Egg is generally registered with a Nest.

NEST -- a host device connected to a cable or satellite or Internet network, and including a library of digital songs that can be copied to Eggs, such as the host device illustrated in **FIG. 1**.

TRY & BUY -- a limited right to play a song that is not owned until an expiration occurs, at which time the song may be purchased for ownership.

DETAILED DESCRIPTION

[0054] Digital music players are proliferating as standalone consumer electronic devices, such as MP3 players, as bundled components within portable devices such as personal data assistants (PDAs) and cell-phones, and as home network appliances. Listeners typically build up their own personal libraries of digital songs, which are stored on memory units such as hard disk drives and removable memory cards. Digital songs are typically acquired through the Internet via subscription services and a la carte purchases, via peer-to-peer exchanges, or by converting songs from a compact disc (CD) and importing them into an MP3 library. Acquiring digital music files may infringe copyrights, unless the files are validly obtained through a service that pays royalties to the copyright holders.

[0055] Digital songs typically include audio data and auxiliary data, referred to as meta-data, used to index the songs within the listener's library. For example, within MP3 files meta-data is accessed through an ID3Tag; WMA files embed meta-data within the files, and both file types can embed meta-data within the filenames themselves. By indexing the songs, a listener can inspect his library, search his library to access individual songs therein, remove songs, and create playlists. Typically audio players provide a user interface through which users view meta-data.

[0056] Barring copyright issues, building up a digital music library requires a lot of time and work. Typically, a listener first searches the Internet for one or more songs of interest, then identifies locations of the songs, and then downloads them into a database associated with a media player. Songs are typically stored as digital files, formatted in compliance with a standard format, such as MP3 or WMA. Once the songs are downloaded, the listener typically uses software such as Windows Media Player or Winamp to play the songs on a computer, or alternatively he copies the songs onto a hardware device, such as an iPod™ or MP3 player, that plays the songs.

[0057] A shortcoming in the world of digital music is the great effort required to build custom music libraries at home. Often individuals spend nights on end downloading their favorite songs and building their own personal music libraries. An alternative is to purchase libraries that have been prepared by others, but often someone else's library does not match another listener's taste and the listener prefers to collect his own favorite songs.

[0058] A popular source for a listener to hear his favorite songs is on music stations. Cable, satellite broadcast and the Internet provide music channels for almost every genre of music – classical music, rock and roll, jazz, music of the 80's, etc. A listener can enjoy music according to his taste by subscribing to such broadcast services.

[0059] Embodiments of the present invention enable a listener to automatically copy and import songs that are broadcast from a music station into his digital music library, along with the songs' meta-data required for indexing his library. Using an embodiment of the present invention a listener, with practically no effort, can automatically build up a large digital music library with tens of thousands of his choice of songs, all properly indexed for search and retrieval. Moreover, an additional feature of embodiments of the present invention enables the listener to select which songs from among those broadcast on the music stations are to be imported into his library, based on one or more of criteria including inter alia genre, song title, artist, album and length of song.

[0060] Copying songs that are broadcast from a music station is akin to copying television programs onto a VCR. Copyright law permits a consumer to copy television programs broadcast to his home onto his VCR. The technology for automatically copying songs, however, is more complex since raw audio recording from a music station does not provide the meta-data necessary to identify such songs and incorporate them into a digital music library. Moreover, each song has to

be separated out from other songs, since songs are played sequentially with overlapping on the music station, generally without breaks in between.

[0061] Embodiments of the present invention concern a method and system for automatically building digital music libraries, from music channels broadcast through cable and satellite stations. In an embodiment of the present invention, broadcast songs are recorded into a digital music library, along with meta-data necessary for indexing and accessing each individual song, and for display while the songs are being played. Using embodiments of the present invention, the digital music library generated from the broadcast music serves as a large library of individual songs, with full search and access capability.

[0062] Embodiments of the present invention provide a system that enables a listener to automatically digitally record broadcast songs into a digital music library, and automatically index each recorded song according to genre, song title, artist and album title, as described hereinbelow. Additionally, embodiments of the present invention enable the listener to filter songs to be automatically recorded, by specifying inter alia a genre, song tile or artist, instead of recording all of the broadcast songs. The listener need not be present while the system of the present invention is in operation. It may thus be appreciated that embodiments of the present invention enable automatic generation of large libraries of songs.

[0063] Embodiments of the present invention use a programmable device, referred to herein as a "Nest," that can interface with computers, with MP3 players and other digital music players, and with other electronic devices that include MP3 players or other digital music players therewithin, including inter alia cell phones, PDAs, home network appliances and Internet appliances. In a first embodiment, the Nest is coupled to a satellite / cable receiver; in a second embodiment, the Nest is coupled to a television; in a third embodiment, the Nest is coupled to various external components via a USB and a Firewire connection.

[0064] In all embodiments, the memory storing the digital music library can be either a large hard disk situated within the Nest itself, or one or more smaller removable memory units such as compact disks and memory cards, or a combination of hard disk and removable memory. The advantage of a large hard disk is that the listener's music library is consolidated into a single library that can be searched and accessed in its entirety. The advantage of removable memory units, such as compact disks, is that the listener can insert the disks into portable players such as MP3 players. Assuming that 40 songs on average require 128 MB of data and include one and a half hour's worth of listening, a large 80 GB hard disk can hold a library of approximately 25,600 songs; and a 640 MB compact disk can hold approximately 200 songs, or about 7½ hours worth of listening.

[0065] Reference is now made to **FIG. 1**, which is a front view of a Nest **100**, in accordance with an embodiment of the present invention. Nest **100** is shown with its front panel open. On the left side of the front panel are female left and right analog audio-in connectors **110** and **120**, and female analog video-in connector **130**, preferably used for connecting auxiliary audio and video devices, such as a CD player, in order to add content into the Nest. On the right side of the front panel are female USB sockets **140** and **150**, preferably used for connecting foreign MP3 players to the Nest; a female Ethernet connector **160**, preferably for connecting the Nest to a computer network; and a mini-jack socket **170**, preferably used to provide analog stereo audio-out for headphones.

[0066] In an embodiment of the present invention, a Nest includes one or more exchange ports **180**, also referred to herein as "cradles," through which one or more hand-held digital music players, referred to herein as "Eggs," can be connected to the Nest, for loading songs from a digital music library stored on the Nest thereto. Such exchange ports may be circular or oval ports into which Eggs are inserted. Thus it may be appreciated that Eggs may be "charged up" with songs while they are plugged into the cradles of the Nest.

[0067] Reference is now made to **FIG. 2**, which is a side view of an Egg **200**, in accordance with an embodiment of the present invention. Egg **200** is shown with a panel **210** that displays meta-data for a song currently being played. As can be seen in **FIG. 2**, the meta-data includes a title ("Blowing in the Wind"), an author ("Bob Dylan") and an album ("Bob Dylan's Greatest Hits").

[0068] Reference is now made to **FIG. 3**, which is a bottom view of the Egg **200** of **FIG. 2**, in accordance with an embodiment of the present invention. The bottom of the Egg includes a female audio/video connector **310**, preferably for transferring analog audio and analog video between the Egg and a Nest; and a female USB connector **320**, preferably for transferring digital data between the Egg and a Nest, between the Egg and a "filling station" kiosk, and between the Egg and another Egg. Corresponding to connectors **310** and **320**, the cradles of the Nest contain male analog audio/video connectors and male USB connectors (not shown in **FIG. 1**).

[0069] A typical usage scenario for a Nest and Egg is as follows. A listener sets his cable or satellite receiver box to a specific music channel, preferably from a commercial-free radio station, such as The Music Choice®, and activates the Nest to capture songs from the music channel. The Nest automatically creates a digital music library and imports the broadcast songs therein. Thereafter, the listener plugs an Egg into a cradle of the Nest, and downloads selected songs from the music library onto the Egg. If the Nest is connected to the listener's speaker system, then the listener may also pipe music from the Nest into speakers in various rooms. If the Nest is connected to a home network, the listener may stream audio to a computer that is authorized to work with the Nest.

[0070] In addition to a Nest being able to download songs to the Egg when the Egg is connected to the Nest, the Nest is also able to remove songs stored in the Egg. Thus, if the Egg storage is full, the Nest can remove songs from the Egg, in order for the Egg to download a new set of songs.

[0071] Eggs of embodiments of the present invention may receive digital music from other sources, in addition to the Nest. Thus the Eggs may be compatible with kiosks, such as music kiosks located in music distribution stores, used for listening to songs prior to purchase and for subsequent purchase. For one embodiment, when an Egg is connected to a Nest, the digital music received from other devices and stored within the Egg can be archived on the Nest.

[0072] It may further be appreciated that an Egg may receive control commands through its USB connector. Specifically,

- when connected to a Nest, the Nest may issue control commands to the Egg, such as a command to advance to the next song; and
- when connected to a docking station, such as a docking station for the Egg in a room of a house, the docking station may receive infra red commands issued by a user, and translate them into control commands to the Egg over the USB connector.

[0073] Reference is now made to **FIG. 4**, which is an illustration of a graphical user interface (GUI) for copying songs from the Nest of **FIG. 1** into the Egg of **FIG. 2**, in accordance with an embodiment of the present invention. The GUI shown in **FIG. 4** is preferably displayed on a television or other display device connected to the Nest, and interacted with through use of a remote control device, such as an infra-red control unit. As such, the GUI of **FIG. 4** is intended for navigation with simple directional buttons and a select button.

[0074] The GUI shown in **FIG. 4** is used to organize a digital music library and create playlists; i.e., sequences of songs for playing from the Nest, or for copying to an Egg for playback from the Egg.

[0075] Embodiments of the present invention enable a customer to listen to music on his Nest, from sources other than the Nest itself, including inter alia the Nest's associated Eggs, and the customer's cell phone that has an embedded audio player. In this regard, reference is now made to **FIG. 5**, which is a simplified block

diagram of a tracking system used to stream a customer's music to the customer's cell phone, in accordance with an embodiment of the present invention. Shown in **FIG. 5** is a customer PC, **510**, which includes a library of the customer's music files, and meta-data describing the music files and the customer's playlists. The customer uses the present invention to register his PC **510** and his cell phone, **520**, with a media tracking server **530**. Cell phone **520** includes an embedded digital audio player **523**, through which the customer can listen to music. Specifically, PC **510** transmits customer information to media tracking server **530**, including inter alia (i) customer name, (ii) customer cell phone **520** handset type, cell provider and phone number, and (iii) PC **510** ID. Additionally, a customer may register his entire household, and submit a household name along multiple customer names, cell phones and PC IDs.

[0076] Access software **515** installed on PC **510** then scans PC **510** to generate a list of IDs of songs resident on PC **510**. Access software **515** also scans PC **510** for player databases, such as iTunes databases, Windows Media Player databases, Napster databases and other such player databases. Access software **515** also scans PC **510** for podcasts that the customer subscribes to and Internet radio station preferences. With each song ID, access software **515** also generates a song status, including inter alia digital rights management data for the song, and time constraints for the song.

[0077] Access software **515** identifies those of the customer's songs that are eligible for tracking, and verifies that the digital rights managed songs have valid licenses. For a song that access software **515** does not recognize, access software sends a snippet of the song to a song database, such as a Gracenote database, which identifies the song from its snippet.

[0078] Access software **515** transmits the customer's song information to media tracking server **530**, which registers the customer, the customer's cell phone, and the customer's song information in its data store. Access software **515** may

additionally transmit the songs themselves to media tracking server **530**. In such case, media tracking server **530** maintains a copy of the user's songs, or further transmits the songs to media streaming server **550**, or both. Media tracking server **530** or media steaming server **550**, or both, thus act as a remote backup of the user's songs.

[0079] Also shown in **FIG. 5** is a media streaming server **550**, which contains a large database archive of audio files, including audio files for the songs referenced in media tracking server **530**.

[0080] Subsequent to registration, the customer can use navigation software **527** on his cell phone **520** to access his songs. Specifically, the customer issues a play request from cell phone **520**, which is transmitted to a cell tower **540**.

[0081] Cell tower **540** is used in **FIG. 5** to represent both a cell tower and a carrier back end. Generally a cell tower forwards requests it receives to a cell carrier backend, and the carrier back end forwards them on. More generally, cell tower **520** and cell tower **540** may operate with any wireless network, including inter alia cellular networks and wi-max networks.

[0082] Cell tower **540** forwards the request to media tracking server **530**, which validates the customer's account, using an account validator **533**. If the customer's account is validated, media tracking server **530** returns meta-data describing the customer's song collections and playlists to cell tower **540**. Specifically, media tracking server **530** returns inter alia ID's of the customer's songs, each song with corresponding meta-data including name, album, artist and genre; and the customer's playlists, each playlist with corresponding meta-data including names and song IDs.

[0083] Cell tower **540** forwards the meta-data to cell phone software **527**, which enables the customer to use the keypad of his cell phone to navigate his collections of songs and playlists, and to select a desired song for listening. An ID for the song selected by the customer is sent from cell phone **520** to cell tower **540**, and

forwarded to media tracking server **530**. Media tracking server **530** verifies that the customer's digital rights management license for the selected song is currently valid, using a song DRM license validator **537**. If the license for the selected song is currently valid, then media tracking server **530** sends an instruction to media streaming server **550** designating the song to be streamed and the cell phone destination.

[0084] In response, media streaming server **550** streams the song to cell tower **540**, which in turn forwards the song to cell phone audio player **523** for the customer's listening enjoyment. If a remote backup of the user's songs is maintained on media tracking server **530**, as described hereinabove, then the remote backup copy of the user's selected song is streamed from media tracking server **530** to cell tower **540**, which in turn forwards the song to call phone audio player **523**.

[0085] Media tracking server **530** logs tracking information indicating that the designated customer is listening to the designated song, within a tracking history. Music streams may be cached on the customer's cell phone **520**, as appropriate, for subsequent access.

[0086] Reference is now made to **FIG. 6**, which is a simplified flowchart of a method for streaming a customer's music to the customer's cell phone, in accordance with an embodiment of the present invention. The flowchart of **FIG. 6** is divided into five columns. The first column on the left indicates operations performed by a customer's personal computer, such as PC **510** (**FIG. 5**) running access software **550**. The second column indicates operations performed by the customer's cell phone, such as cell phone **520** that includes an embedded audio player **523** and play software **560**. The third column indicates operations performed by a cell tower and a carrier backend, such as cell tower and carrier backend **540**. The fourth column indicates operations performed by a tracking server, such as

media tracking server **530**. The fifth column indicates operations performed by a media server, such as media streaming server **580**.

[0087] **FIG. 6** includes two stages; namely, a first stage for registering a customer's PC with the tracking system, which begins at operation **605**, and a second stage for enabling a customer to play his songs on his cell phone, which begins at operation **620**.

[0088] At operation **605** the customer's PC registers itself with the tracking server. Access software running on the PC scans the PC and generates a list of song IDs and playlists into which the customer has organized his songs. At operation **610** the PC uploads the list of the customer's songs and his playlists to the tracking server, together with information identifying the customer and the customer's cell phone. The PC may additionally upload the customer's songs themselves to the tracking server, as described hereinabove. At operation **615** the tracking server registers the customer and the customer's cell phone, and stores the list of the customer's songs and his playlists in its data store. At this stage the PC has been registered with the tracking system, and the customer is then able to listen to his songs on his cell phone.

[0089] At operation **620** the customer issues a play request on his cell phone. At operation **625** the cell phone transmits the play request to the cell tower, using a wireless transmission protocol, such as GPRS/3G. At operation **630** the cell tower receives the play request and forwards it to the tracking server, via the wireless protocol. At operation **635** the tracking server receives the play request and validates the customer's account. If the customer account is successfully validate, than at operation **640** the tracking server sends the customer's song collections and playlist information to the cell tower, via the wireless protocol. Otherwise, the tracking server denies the customer's play request. At operation **645** the cell tower forwards the customer's song collections and playlist information to the cell phone, via the wireless protocol.

[0090] Alternatively, the customer's playlist information may be cached in the customer's cell phone, thereby obviating the need to perform operations **630 - 645**. Such cached playlist information is periodically refreshed to ensure that it accurately reflects the content and licenses on the customer's PC. The refresh operation may be performed with or without user intervention.

[0091] At operation **650** the customer uses the keypad of his cell phone to navigate his playlists and select a desired song for listening. The user's selection is then transmitted to the cell tower, via the wireless protocol.

[0092] At operation **655** the cell tower receives the user's song selection, which it then forwards to the tracking server. At operation **660** the tracking server validates the customer's digital rights management license for the selected song, to ensure that the user has the necessary license to play the song. The tracking server may have the customer's license stored therein for examination, or else query the customer's PC to determine validity of the customer's license. In the latter case, the tracking server denies the customer's play request if the customer's PC is not connected.

[0093] If the customer's license for the selected song is valid, then at operation **665** the tracking server sends instructions to the media server to stream the selected song to the customer's cell phone. Otherwise, the tracking server denies the customer's play request. The tracking server may also log the event that the designated customer is listening to the selected song, within a tracking history.

[0094] At operation **670** the media server receives the instruction from the tracking server, and initiates streaming of the selected song to the cell tower. The cell tower receives the streamed data, and forwards it to the customer's cell phone for his listening enjoyment. After the song finished playing the customer may return to operation **650** and select another song.

[0095] It will be appreciated by those skilled in the art operation **660** ensures that the cell phone access enabled by the present invention does not enable a customer to circumvent digital rights management license restrictions.

Copyright Management

[0096] In accordance with an embodiment of the present invention, an Egg is registered with at most one Nest, and only Eggs registered with a Nest have the right to check-out non-promotional songs therefrom, as described hereinbelow. Typically, a Nest will have multiple Eggs registered with the Nest.

[0097] In accordance with an embodiment of the present invention, a song within a Nest or an Egg is labeled as "Purchased", "Recorded" or "Try & Buy". A "Purchased" song is one that is paid for by a consumer. Purchased songs include inter alia songs purchased through an Internet service such as iTunes® or Napster®, songs purchased through a kiosk, and songs copied and converted ("ripped") to a format such as MP3 from a CD that is purchased. "Recorded" songs include songs recorded for a consumer from a cable or satellite music station. "Try & Buy" songs are promotional or trial versions of songs that are provided to a consumer for free, and eventually expire. If the consumer wishes to continue to listen to such songs, he must obtain a Purchased or Recorded version of the song.

[0098] Expiration of a Try & Buy song may occur inter alia after a fixed time period, such as thirty days, or after a fixed number of playbacks of the song. Upon expiration, a Try & Buy song may cease to play altogether, or may play only a down-sampled version of the song or a header of the song, or may instead play a message explaining how to purchase the song, or otherwise enable purchase of the song.

[0099] Preferably, the label of a Try & Buy song includes a URL or other such identifier for one or more web sites that serve as a clearinghouse through which the song can be purchased.

[00100] In accordance with an embodiment of the present invention, the Nest includes a list of songs that are already contained within the Nest and an auxiliary list of songs that are not already contained within the Nest. For example, whenever a song from a specific album by a specific artist is contained within the Nest, the auxiliary list includes other songs from the same album or other songs by the same artist. Songs that have been recorded within the Nest are labeled as Recorded. Other songs, not contained within the Nest, can preferably be downloaded to the Nest as trial Try & Buy versions, upon request by a consumer. After listening to a Try & Buy version of a song, the consumer may purchase the song using the Nest, and the purchased song is then labeled as Purchased. Such labeling of a song as Recorded, Purchased or Try & Buy serves to identify the copyrights associated with the song.

[00101] Preferably, when a song is copied from one device to another device where the two devices are registered with one another, such as from a Nest to an Egg that is registered with the Nest, or from an Egg to a Nest that the Egg is registered with, the label of the song is maintained; i.e., the label of the song on the target device is set to the label of the song on the source device. For example, if a Try & Buy song is copied from a Nest to an Egg that is registered with the Nest, and then to another Egg that is also registered with the same Nest, then the song is labeled as Try & Buy on the two Eggs. Similarly, if an Egg is used to purchase a song from a kiosk and the song is subsequently copied to a Nest that the Egg is registered with, then the song is labeled as Purchased on the Egg and on the Nest.

[00102] In an embodiment of the present invention, when a song is copied from one device to another device where the two devices are not registered with one another, such as from a Nest to an Egg or from an Egg to a Nest, where the Egg is not registered with the Nest, then regardless of the label of the song on the source device, the song is labeled as Try & Buy on the target device.

[00103] **TABLE I** summarizes the copyright labeling of a song on a target device.

TABLE I: Copyright Label of Song on Target Device	
Source Device --> Target Device	**Source Label --> Target Label**
Nest --> Egg registered with the Nest OR	Purchased --> Purchased
Egg registered with Nest --> Nest OR	Recorded --> Recorded
Egg --> Egg, both Eggs registered with the same Nest	Try & Buy --> Try & Buy
Nest --> Egg not registered with the Nest OR	Purchased --> Try & Buy
Egg not registered with Nest --> Nest OR	Recorded --> Try & Buy
Egg --> Egg, Eggs registered with the different Nests	Try & Buy --> Try & Buy
Cable / satellite broadcast --> Nest	--> Recorded
CD or other recording media (optical, magnetic, etc.) --> Nest CD or other recording media (optical, magnetic, etc.) --> Egg Internet music service (iTunes®, Napster®) --> Nest Music kiosk --> Egg	--> Purchased

[00104] The logic of **TABLE I** assumes that any two devices can determine whether or not they are commonly registered. This capability can be achieved, for example, if the registration information is built into a Nest and an Egg at the time of manufacture.

[00105] In addition to the logic of **TABLE I**, the label of a song within a Nest or an Egg is changed from Try & Buy to Purchased if a user purchases the song from a clearinghouse, using the Nest or the Egg, respectively.

[00106] In an alternative embodiment of the present invention, the Nest can directly determine whether an Egg is registered with it, but an Egg cannot directly determine whether it is registered with a Nest, or whether it and another Egg are registered to the same Nest. This occurs, for example, if an Egg has the capability of registering itself with any one of a plurality of Nests after it is manufactured. In

this latter case, the logic of **TABLE I** is modified so that whenever a song is copied from a source Egg to a target Egg, the song is labeled as Try & Buy in the target Egg. Accordingly, the copyright labeling of a song on a target device follows **TABLE II**.

TABLE II: Copyright Label of Song on Target Device (Alternate)

Source Device --> Target Device	**Source Label --> Target Label**
Nest --> Egg registered with the Nest OR Egg registered with Nest --> Nest	Purchased --> Purchased
	Recorded --> Recorded
	Try & Buy --> Try & Buy
Nest --> Egg not registered with the Nest OR Egg not registered with Nest --> Nest OR Egg --> Egg	Purchased --> Try & Buy
	Recorded --> Try & Buy
	Try & Buy --> Try & Buy
Cable / satellite broadcast --> Nest	--> Recorded
CD or other recording media (optical, magnetic, etc.) --> Nest CD or other recording media (optical, magnetic, etc.) --> Egg Internet music service (iTunes®, Napster®) --> Nest Music kiosk --> Egg	--> Purchased

[00107] In this alternative embodiment, an Egg that is registered with a first Nest may be re-registered with a second Nest. In such case, the Egg is no longer registered with the first Nest. Preferably, there is a limit to the number of times an Egg can be re-registered, and after an Egg re-registers itself a maximum number of times, it is blocked from further re-registration.

[00108] In a second alternative embodiment of the present invention, the distinction between Purchased and Recorded songs is ignored, and both are identified as "Owned" songs. In this second alternative embodiment, the copyright labeling of a song on a target device follows **TABLE III**.

TABLE III: Copyright Label of Song on Target Device (Second Alternate)	
Source Device --> Target Device	**Source Label --> Target Label**
Nest --> Egg registered with the Nest OR Egg registered with Nest --> Nest OR	Owned --> Owned
Egg --> Egg, both Eggs registered with the same Nest	Try & Buy --> Try & Buy
Nest --> Egg not registered with the Nest OR Egg not registered with Nest --> Nest OR	Owned --> Try & Buy
Egg --> Egg, Eggs registered with the different Nests	Try & Buy --> Try & Buy
Cable / satellite broadcast --> Nest	--> Owned
CD or other recording media (optical, magnetic, etc.) --> Nest CD or other recording media (optical, magnetic, etc.) --> Egg Internet music service (iTunes®, Napster®) --> Nest Music kiosk --> Egg	--> Owned

[00109] In yet a third alternative embodiment of the present invention, copying of songs from a Nest to multiple Eggs, each of which is registered with the Nest, is restricted. This third alternative embodiment has a more elaborate logic than the preferred and first and second alternative embodiments. In order to best describe this logic, the terms "checking-out" and "checking-in" of songs are used as follows. When an Egg is connected to a Nest in order to download songs from the Nest to the Egg, this is referred to herein as "checking-out" of songs. When an Egg is connected to a Nest in order to remove songs stored in the Egg, this is referred to herein as "checking-in" of songs.

[00110] Often the same song can be broadcast multiple times from a cable or satellite music station, while the Nest is operational to record the broadcast songs. For one embodiment of the present invention, the Nest stores a count for each Recorded song, which is incremented when the Nest encounters a broadcast song that has already been recorded onto the Nest archive. Such count thus corresponds

to the total number of times the Recorded song has been broadcast while the Nest was recording, and is denoted henceforth as max_permitted_copies. For example, if a Recorded song is re-played five times on the Music Channel while the Nest is recording from the Music Channel, then max_permitted_copies = 5 for such song.

[00111] The max_permitted_copies count for a Recorded song is used to restrict the number of different Eggs that the Nest allows to check-out the song. For example, if max_permitted_copies = 5 for a Recorded song, then at most five different Eggs can check-out the song from the Nest. That is, for each Recorded song in its archive, the Nest stores a count for each song, which is incremented when an Egg checks-out the song. Such count corresponds to the number of Eggs that have checked-out the song, and is denoted henceforth as number_copies_checked_out. For example, if three Eggs have checked-out the same Recorded song from the Nest, then number_copies_checked_out = 3 for such song.

[00112] In accordance with an embodiment of the present invention, when an Egg checks-in a Recorded song with the Nest, thereby removing the song from the Egg, the number_copies_checked_out count is decremented. For example, if number_copies_checked_out = 3 for a Recorded song and an Egg that checked-out the song subsequently checks-in the song, then number_copies_checked_out is decremented to 2 for such song.

[00113] Reference is now made to **FIG. 7** which is a simplified flowchart of a method for tracking the number of times the same song is broadcast while the Nest **100** of **FIG 1** is recording music, in accordance with an embodiment of the present invention. At operation **710** the Nest identifies a song being broadcast from a cable or satellite station that is currently being recorded by the Nest. At operation **720** the Nest determines whether or not the song is already stored within the Nest's digital archive. If so, then at operation **730** the Nest increments max_permitted_copies by one. Otherwise, at operation **740** the Nest initializes max_permitted_copies = 1 for

the song, and number_copies_checked_out = 0 for the song. At operation **750** the Nest stores the Recorded song and its meta-data within the Nest's digital archive.

[00114] Reference is now made to **FIG. 8**, which is a simplified flowchart of a method for "checking-out" Recorded songs from the Nest of **FIG. 1** to the Egg of **FIG. 2**, in accordance with an embodiment of the present invention. At operation **810** an Egg that is connected to a cradle in a Nest requests to copy a Recorded song from the Nest to the Egg. At operation **820** the Nest determines whether or not the Egg is registered with the Nest. If so, then at operation **830** the Nest determines whether number_copies_checked_out is less than max_permitted_copies for the requested song. If so, then at operation **840** the Nest increments number_copies_checked_out for the song by one, and at operation **850** the Nest permits the Egg to copy the song from the Nest to the Egg.

[00115] If, at operation **820** the Nest determines that the Egg is not registered with the Nest, or if, at operation **830**, the Nest determines that number_copies_checked_out is equal to max_permitted_copies, then the Egg's request for the Recorded song is denied at operation **860**. Alternatively, the Recorded song may be copied onto the Egg as a trial version, and labeled Try & Buy.

[00116] Reference is now made to **FIG. 9**, which is a simplified flowchart of a method for "checking-in" songs from the Egg of **FIG. 2** to the Nest of **FIG. 1**, in accordance with an embodiment of the present invention. If a song labeled Try & Buy is checked in from an Egg to a Nest, then the song is also labeled Try & Buy on the Nest.

[00117] If a song labeled Recorded is checked in from an Egg to a Nest, then at operation **910** an Egg connected to a cradle in the Nest requests to check-in the Recorded song. At operation **920** the Nest determines whether or not the Egg is registered with the Nest. If so, then at operation **930** the Nest determines whether or not the song already resides within the Nest's digital archive. If so, then at operation

940 the Nest decrements number_copies_checked_out for the song by one, and at operation **950** the Nest instructs the Egg to erase the song from the Egg.

[00118] If at operation **920** the Nest determines that the Egg is not registered with the Nest, than the Egg's request to check-in the song is denied at operation **960**. Alternatively, the song may be copied onto the Nest as a trial version, and labeled Try & Buy. If at operation **930** the Nest determines that the song does not currently reside within its digital archive, then this indicates that the Egg obtained the song from another source, such as from a kiosk. As such, at operation **970** the Nest initializes max_permitted_copies = 1 for the song, and number_copies_checked_out = 0 for the song. At operation **980** the Nest copies the song and its meta-data from the Egg into the Nest's digital archive.

[00119] When a Recorded song is copied from a first Egg to a second Egg in this embodiment, the song is labeled as Try & Buy on the second Egg, even if the first and second Egg are both registered to the same Nest.

[00120] Purchased songs may also be restricted for copying to multiple Eggs with similar logic, by setting max_permitted_copies = 1.

[00121] In general, it may now be appreciated by those skilled in the art that the present invention supports a general digital rights configuration, by means of rules that specify whether or not a song residing on a source device has requisite permission for copying to a target device and, if so, how the song should be labeled when copied to the target device. Such rules may be embodied within functions

```
        mayBeCopied(srcDeviceType, trgtDeviceType,
isRegistered, srcDeviceLabel),
        trgtLabel(srcDeviceType, trgtDeviceType, isRegistered,
srcLabel),
```

where `srcDeviceType` and `trgtDeviceType` are device specific parameters:

srcDeviceType indicates the type of the source device in which the digital song resides, including inter alia Nest and Egg; and

trgtDeviceType indicates the type of the target device onto which the digital song is to be copied, including inter alia Nest and Egg;

where isRegistered is specific to a pair of devices:

isRegistered indicates whether or not the source device and target device are commonly registered;

where srcLabel and trgtLabel are both song and device specific parameters:

srcLabel indicates the label of the song on the source device, including inter alia Recorded, Purchased and Try & Buy or, alternatively, Owned and Try & Buy; and

trgtLabel indicates the label of the song on the target device, including inter alia Recorded, Purchased and Try & Buy or, alternatively, Owned and Try & Buy; and where:

mayBeCopied indicates whether or not the song may be copied from the source device to the target device.

[00122] More generally, as described hereinabove, the functions mayBeCopied() and trgtLabel() may have additional parameters max_permitted_copies and number_copies_checked_out,

where max_permitted_copies and number_copies_checked_out are both song and device specific parameters:

max_permitted_copies indicates the maximum number of copies of the song that are permitted from the device; and

number_copies_checked_out indicates the current number of copies of the song that have been made from the device.

[00123] It may be appreciated by those skilled in the art that alternatively the functions `mayBeCopied()` and `trgtLabel()` may be embodied as tables or other data structures.

[00124] Reference is now made to **FIG. 10**, which is a simplified block diagram of a digital rights management system, in accordance with an embodiment of the present invention. Shown in **FIG. 10** is a source device **1005** including a database manager **1010** and a rights manager **1015**. Database manager **1010** preferably controls a database **1020** that stores digital songs and meta-data associated therewith. Preferably, the meta-data includes a label for each song, indicating whether the song is Purchased, Recorded or Try & Buy, as described hereinabove. Optionally, the meta-data may also include `max_permitted_copies` and `number_copies_checked_out` for one or more songs. The songs, their labels, and their `max_permitted_copies` and `number_copies_checked_out` parameters are accessible through database manager **1010**.

[00125] It may be appreciated by those skilled in the art that digital songs and their meta-data may be stored in one or more database tables, within database **1020**, that can be joined. Alternatively, the binary song data may be stored in memory locations outside of database **1020**, and pointed to by address entries in database **1020**. It may also be appreciated that database **1020** may instead be structured as a plurality of databases.

[00126] Also shown in **FIG. 10** is a target device **1025**, including its own database manager **1030**, rights manager **1035** and database **1040**.

[00127] Rights manager **1015** determines whether or not a song resident on source device **1010** may be copied to a specified target device, such as target device **1025**. If copying of the song is permitted, then rights manager **1015** further determines a label to be used for the song on the target device, referred to as the target label. In accordance with an embodiment of the present invention, rights manager **1015** bases its determination on (i) the type of source device **1005**, (ii) the

type of target device **1025**, (iii) the label of the song on source device **1005**, and (iv) the `max_permitted_copies` and `number_copies_checked_out` parameters for the song on source device **1005**. Rights manager **1015** preferably implements functions such as `mayBeCopied()` and `trgtLabel()` described hereinabove.

[00128] After rights manager **1015** determines the target label, it transmits the song and the target label to target device **1025**. Target device **1025** preferably adds the song to its database **1040** and labels the song in database **1040** according to the target label.

[00129] Also shown in **FIG. 10** is a clearing house **1045**, for purchasing songs. Source device **1005** and target device **1025** may purchase songs directly from clearing house **1045**. For songs not currently resident on source device **1005** or target device **1025**, clearing house **1045** sends the songs to the device that purchases them. For songs currently resident on source device **1005** or target device **1025** labeled Try & Buy, clearing house **1045** sends an authorization to source database manager **1010** or target database manager **1030** to change the label of the songs from Try & Buy to Purchased. Clearing house **1045** preferably includes a transaction processor **1050**, which enables a user to purchase rights to songs and verifies the user's payment. Upon completion of a user's purchase of a song by transaction processor **1050**, clearing house **1045** sends the songs to the user's device, or sends an authorization to the user's device to change the label of the song, as appropriate.

[00130] In accordance with an embodiment of the present invention, clearing house **1045** also freely distributes Try & Buy versions of songs, which can be converted to Purchased versions at a later date, if a user so desires.

[00131] For one embodiment, clearing house **1045** is administered by an entity that has distribution privileges for the songs it sells, such as a cable or satellite company.

[00132] Reference is now made to **FIG. 11**, which is a simplified flow chart for a digital rights management method, in accordance with an embodiment of the present invention. As can be seen, **FIG. 11** is divided into two columns, the leftmost column indicating operations performed by a source audio device, such as source device **1005** (**FIG. 10**) and the rightmost column indicating operations performed by a target audio device, such as target device **1025**.

[00133] At operation **1110** the target device requests a song to be copied from the source device. At operation **1120** the source device receives the request and identifies the target device. In particular, the source device determines the type of the target device, and whether or not the source and target device are registered with one another.

[00134] At operation **1130** the source device determines the label for the requested song, and the `max_permitted_copies` and `number_copies_checked_out` parameters for the requested song. Preferably, this information is contained within a source device database, such as database **1020** (**FIG. 10**). At operation **1140** the source device determines whether or not the target device has permission to copy the song. Preferably such determination is made by a rights manager within the source device, such as rights manager **1015**. If it is determined at operation **1140** that the target device does not have permission to copy the song from the source device, then at operation **1150** the source device denies the copy request. Otherwise, if it is determined at operation **1140** that the target device does have permission to copy the song from the source device, then at operation **1160** the source device determines how to label the song within the target device. Preferably, such determination is also made by a rights manager, such as rights manager **1015**.

[00135] At operation **1170** the source device transmits the requested song and its label to the target device, and at operation **1180** the target device copies the requested song to its database, and labels it accordingly.

[00136] In reading the above description, persons skilled in the art will realize that there are many apparent variations that can be applied to the methods and systems described. Thus, the configurable logic described hereinabove for songs and audio devices is applicable as well to movies and video devices, and to other types of media and media devices.

[00137] Transfer of songs from sources devices to target devices, and from clearinghouses to devices, may be performed in batches of songs, such as entire albums, as well as for single songs. In addition, devices may be "hot-synched" to one another. For example, an Egg may be hot-synched to a Nest, using wired or wireless communication, so that the Nest is updated periodically with the songs in the Egg.

[00138] Reference is now made to **FIGS. 12A** and **12B**, which are simplified illustrations of a first consumer use case of acquiring a song in accordance with an embodiment of the present invention. As shown in **FIG. 12A**, a consumer **1210** downloads a trial version of a song onto his Egg **1220** from a McMusic kiosk **1230** located within a McDonald's store **1240**. The song is labeled Try & Buy, and consumer **1210** has limited rights to play the song for a one-week trial period. Subsequently, as shown in **FIG. 12B**, consumer **1210** decides to purchase the song for $1.00 from a clearinghouse via wireless communication. As a result of the purchase, the song is re-labeled as Purchased in Egg **1220**, and consumer **1210** is granted full rights to the song.

[00139] Also shown in **FIG. 12B** is a pie chart **1250** illustrating how the $1.00 of revenue for the song is allocated between the content owner, the wireless provider, McDonald's and the owner of the present invention, as described hereinbelow.

[00140] Reference is now made to **FIGS. 13A** and **13B**, which are simplified illustrations of a second consumer use case of acquiring a song in accordance with an embodiment of the present invention. As shown in **FIG. 13A**, a consumer downloads a trial version of a song onto his Egg **1320** from a Starbuck's Sounds

music kiosk **1330** located within a Starbuck's store **1340**. The song is labeled Try & Buy, and consumer **1310** has limited rights to play the song for a one-week trial period. Subsequently, as shown in **FIG. 13B**, consumer **1310** decides to purchase the song for $1.00 from a McMusic kiosk **1350** located within a McDonald's store **1360**. As a result of the purchase, the song is re-labeled as Purchased in Egg **1320**, and consumer **1310** is granted full rights to the song.

[00141] Also shown in **FIG. 13B** is a pie chart **1370** illustrating how the $1.00 of revenue for the song is allocated between the content owner, Starbuck's, McDonald's and the owner of the present invention, as described hereinbelow.

[00142] Reference is now made to **FIGS. 14A**, **14B** and **14C**, which are simplified illustrations of a third consumer use case of acquiring a song in accordance with an embodiment of the present invention. As shown in **FIG. 14A**, a consumer **1410** records a song from a DirectTV broadcast music station onto her Nest **1420**, while enjoying home entertainment on her television **1430**. The recorded song is labeled as Recorded, and consumer **1410** has corresponding rights to the song. Consumer **1410** copies the song from her Nest **1420** onto her Egg **1440**.

[00143] Subsequently, as shown in **FIG. 14B**, consumer **1410** meets a friend, namely consumer **1450**, who expresses interest in the song. Consumer **1410** then copies the song from her Egg **1440** onto his Egg **1460**. Although the song is labeled as Recorded on Egg **1440**, the song is labeled as Try & Buy on Egg **1460**. As such consumer **1450** only has limited rights to play the song for a one week trial period.

[00144] Subsequently, as shown in **FIG. 14C**, consumer **1450** decides to purchase the song, which he does for $1.00 via a music kiosk **1470** located in a Best Buy store **1480**. After purchasing the song, the song is re-labeled from Try & Buy to Purchased within Egg **1460**, as a result of which consumer **1450** then has full rights to the song.

[00145] Also shown in **FIG. 14C** is a pie chart **1490**, indicating allocation of the $1.00 purchase price for the song between the content owner, DirectTV, Best Buy and the owner of the present invention, as described hereinbelow.

Implementation of the Present Invention in Conjunction with Conventional Digital Rights Management Systems

[00146] The digital rights management of the present invention can be implemented in conjunction with a third-party DRM method or system. Conventional DRM systems typically allow usage of music on a disconnected mobile device, but do not allow sharing from one disconnected device to another. With conventional DRM systems, if a disconnected mobile device receives music for which it does not have a valid license, it is not able to play the music, and will not be granted a license until it connects to a license server, usually by docking to a personal computer.

[00147] In distinction, using embodiments of the present invention music may be shared from a first consumer's Egg to a second consumer's Egg, and the second consumer is granted limited Try & Buy access to the music, with an option to purchase the music.

[00148] If a conventional DRM wrapper is removed from digital music, even if it is replaced with another DRM wrapper, then typically conventional players will not be able to play the music at all. As such, embodiments of the present invention preserve the conventional DRM wrapper, thus ensuring backward compatibility.

[00149] Reference is now made to **FIG. 15**, which is a simplified illustration of a workflow for implementing digital rights management in conjunction with a third-party DRM system, in accordance with an embodiment of the present invention. Shown in **FIG. 15** is a first copy **1505** of a digital work stored in a user's Nest. The copy includes a digital audio portion **1510**, which has been licensed by the user, and a third-party DRM wrapper **1515** specifying unlimited play for the user's nest only.

[00150] When the user copies the digital work from his Nest (copy **1505**) to his Egg, a second copy, **1520**, of the digital work is created. The second copy **1520** includes a digital audio portion, **1525**, preferably substantially similar to portion **1510**, and a third-party DRM wrapper **1530**. However, the third-party DRM wrapper has been modified so as to specify unlimited play on all eggs, with a prescribed timeout,

such as a two-week timeout. In addition, an auxiliary DRM wrapper **1535** is added to the second copy, **1520**, specifying unlimited play on the user's Egg, and the ability to generate limited play licenses for other devices.

[00151] When the user shares the digital work with his friend, a third copy, **1540**, of the digital work is created as the digital work is copied from the user's Egg (copy **1520**) to his friend's Egg (**1540**). The third copy **1540** includes a digital audio portion, **1545**, preferably substantially similar to portion **1510**, and a third-party DRM wrapper **1550** that is substantially identical to the third-party digital wrapper **1530** from the second copy **1520**. The third copy **1540** also includes an auxiliary DRM wrapper **1555**, but in distinction to DRM wrapper **1535**, DRM wrapper **1555** specifies limited play on the friend's Egg, and the ability to generate limited play licenses for other devices.

[00152] When the friend copies the digital work from the friend's Egg (copy **1540**) to the friend's Nest, a fourth copy, **1560**, of the digital work is created. The fourth copy **1560** includes a digital audio portion, substantially similar to portion **1510**, and a third-party DRM wrapper **1570** specifying limited play on the friend's Nest only. It will be noted that the auxiliary DRM layer is removed in copy **1560**. As such, the music on the friend's Nest can be played by a conventional player.

[00153] It may be appreciated in **FIG. 15** that the auxiliary DRM wrappers **1535** and **1555**, instead of being stored within various copies of the digital work, may instead be stored in separate files associated within the copies of the digital work, or may alternatively be stored in a database table having a primary key that serves as an identifier for a copy of the digital work. Similarly, the conventional third-party DRM wrappers **1515**, **1530**, **1550** and **1570** may also be stored in separate files or within a database table.

Use of the Present Invention for Usage and Merchandising Tracking

[00154] As illustrated in **FIGS. 12B**, **13B** and **14C**, embodiments of the present invention has application to usage tracking for purposes of revenue sharing or aggregation of statistics. Licenses for digital music may be purchased through several channels, including inter alia

(i) music recorded onto a Nest from broadcast, off-the-air;

(ii) music purchased through a Nest from a licensing authority; and

(iii) music purchased through an Egg from a music kiosk.

Music for preview, with a Try & Buy wrapper, may be licensed from these same channels.

[00155] Embodiments of the present invention are advantageous for tracking the following information for songs:

(a) if recorded, when it was recorded and from which provider;

(b) if purchased directly, the fulfiller of the purchase;

(c) if shared, the customer who originally owned the copy, the original fulfiller, and the sharing chain of users;

(d) play information for the current owner, whether played on the owner's Nest or the owner's Egg; and

(e) if upgraded from a Try & Buy version, the fulfiller of the original purchase by the original owner and the fulfiller of the purchase from the Try & Buy version.

[00156] Reference is now made to **FIG. 16**, which is a simplified workflow for usage and merchandising tracking in accordance with an embodiment of the present invention. Shown in **FIG. 16** is a first copy, **1605**, of a digital work that is purchased by user A, on user A's Nest. User A may have purchased the digital work, for example, over the Internet through a licensing authority, or on a CD at a retail store. Copy **1605** includes a digital audio portion, **1610**, and a record, **1615**, including user A's purchase information and user A's usage data on user A's Nest.

[00157] When user A copies the digital work from his Nest to his Egg, a second copy of the digital work, **1620**, is created. Copy **1620** includes a digital audio portion, substantially similar to digital audio portion **1610**, and a record, **1630**, including user A's purchase information and user A's usage data on user A's Nest and user A's Egg.

[00158] When user A shares the digital work with user B, a third copy of the digital work, **1635**, is created. Copy **1635** is a Try & Buy copy, since user B has not yet purchased a license for the digital work. Copy **1635** includes a digital audio portion, **1640**, substantially similar to digital audio portion **1610**, and a record, **1645**, including user A's purchase information and user B's usage data on user B's Egg.

[00159] When user B copies the digital work from user B's Egg to user B's Nest, a fourth copy of the digital work, **1650**, is created. Copy **1650** includes a digital audio portion, **1655**, substantially similar to digital audio portion **1610**, and a record, **1660**. When user B subsequently purchases a license for the digital work, record **1660** is updated to reflect user A's purchase data, user B's purchase data and user B's usage data on user B's Egg and user B's Nest.

[00160] It may thus be appreciated that, for the purpose of merchandising, a portion of user B's purchase price may be paid to the fulfiller from which user A purchased the digital work. More generally, embodiments of the present invention can be used to track a purchase of a digital work along a sharing chain, back to an original fulfiller from which the digital work was purchased; and a portion of the purchase prices along the sharing chain can be allotted to the original fulfiller.

[00161] It may be appreciated in **FIG. 16** that the records **1615**, **1630**, **1645** and **1660**, instead of being stored within various copies of the digital work, may instead be stored in separate files associated within the copies of the digital work, or may alternatively be stored in a database table having a primary key that serves as an identifier for a copy of the digital work.

[00162] In accordance with an embodiment of the present invention, an application programming interface (API) for Eggs is provided, in order for third parties to use the tracking features of the present invention. Inter alia, the Egg API includes the following functions.

- `addSongPlayToHistory(trackID)`

This function adds information to an Egg's internal song playback history, when a tracked song begins playing.

- `addSongShareToHistory(trackID)`

This function adds information to an Egg's internal song sharing history, when a tracked song is shared from one device to another.

- `addSongSkipToHistory(trackID)`

This function adds information to an Egg's internal song playback history, when a tracked song gets skipped while playing; i.e., when a user jumps to another song in the middle of playing the tracked song.

- `buildPlayerInventory()`

This function generates a list of tracked songs on an Egg, and is used generally when connecting the Egg to a kiosk or to a personal computer.

- `buildPlayerDockInventory()`

This function generates a list of tracked songs on a Nest, and is used generally when connecting an Egg to the Nest, so that the user does not purchase a song at a kiosk that he already has on his Nest at home.

- `songOwnedOnPlayer(trackID)`

This function checks if `trackID` is currently owned on an Egg.

- `songOwnedOnDock(trackID)`

This function checks if `trackID` is currently owned on a Nest.

- `buildSongPlayHistory(trackID)`

This function builds a history of all times `trackID` has been played or skipped. The history is generally uploaded to a personal computer or to a kiosk, and then to a server computer for tracking use.

- `deleteSongPlayHistory(trackID)`

This function clears an Egg's internal play history for `trackID`, and is generally called after the Egg's play history has been uploaded to a tracking server computer, in order that the same data is not uploaded twice.

- `storeContentLicense(trackID, contLicense)`

This function stores the necessary licenses to played a digital rights managed song, in an Egg's protected data store. This function also associates the license with the song so that whenever the song is played, the license may be used to unlock it.

- `storeOriginationData(trackID, origData)`

This function stores information in the Egg's internal memory, as to the origin of a song.

- `shareHistory buildSongShareHistory(trackID)`

This function builds a share history object that holds a history of all times the designated track has been shared. The history is a trail of devices that the song has passed through prior to arriving at the current Egg. This function is generally called before sharing a song with another device, and the share history is then sent to the other device.

- `deleteSongShareHistory(trackID)`

This function clears a song's share history from an Egg's internal memory. This function is generally called when a customer erases the song, or when the customer purchases the song.

- `storeShareData(trackID, shrHistory)`

This function stores a share history for a song in an Egg's internal memory, and is generally called after the Egg receives a shared song. This function stores the

current share history, and also adds information about the Egg to the share history, so that the next time the song is shared, the Egg will be reflected in the share history.

[00163] Embodiments of the present invention include an advertising and deployment component that provides a wide range of advertising opportunities for sponsors. Reference is now made to **FIG. 17**, which is a simplified block diagram of a system for deployment of advertisements in customer Egg players, in accordance with an embodiment of the present invention. Shown in **FIG. 17** are three primary components; namely, (i) a portable player **1710**, such as an Egg, with a playback engine **1712**, (ii) a host device **1720**, such as a Nest, a kiosk or a PC computer, and (iii) an advertising server **1730**. The connection between Egg **1710** and host device **1720** is generally via a docked connection, when Egg **1710** is docked into a cradle of host device **1720**. The connection between host device **1720** and advertising server **1730** is generally a remote connection, via a cable network, a satellite network, a cellular network, or via the Internet.

[00164] Briefly, advertiser computers, such as advertisers **1743**, **1745** and **1747**, upload ads, distribution rules and playback rules to advertising server **1730**. Playback rules govern when advertisements are to be played. Distribution rules govern the process of moving ads from advertising server **1730** to appropriate players **1710**. Distribution rules specify relationships between ads and content, so that promotional content is associated with one or more desired ads. Distribution rules are also used to specify relationships between ads and player types, so that a targeted set of players **1710** receive specific advertisements. Advertising server **1730** transmits the ads and rules to host device **1720**, for deployment in players **1710** when the players connect to the host device. Advertiser computers **1743**, **1745** and **1747** are generally connected to advertising server **1730** via the Internet.

[00165] Advertisers may sponsor songs, or Egg players **1710** themselves with pre-loaded content and with sponsored branding on their cases. Advertisers may

distribute sponsored content to consumers' Eggs **1710** along with ads. An ad management interface **1735** provides a web interface through which a sponsor manages ads that are deployed in consumers' Eggs **1710**. Ad reporting & metric interface **1733** provides a web interface through which a sponsor receives tracking information including inter alia how many ad impressions were generated.

[00166] Ad management interface **1735** gives the sponsor much flexibility in controlling his advertising. The sponsor can use ad management interface **1735** to submit ads, to remove ads, to update ads and to insert new ads; and to submit sponsored music content, to remove sponsored music content, to update sponsored music content and to insert new sponsored content. The sponsor can also use ad management interface **1735** to define rules in terms of conditions that trigger the ads to be played, and to designate which rules are to be used for which sponsored Eggs, as described in detail hereinbelow. When Customers' sponsored Eggs **1710** are connected to a host device **1720**, ads and sponsored content and rules are transferred to the Eggs. Conversely, statistical information about ads that the customers heard on their Eggs is transferred to advertising server **1730**.

[00167] In accordance with an embodiment of the present invention, a ad may be designated so that a customer cannot fast forward through the ad or skip the ad, and so that a customer cannot delete the ad from his Egg player without losing valuable content.

[00168] In accordance with an embodiment of the present invention, an advertiser may distribute Eggs with branded casing and with pre-loaded music to customers as part of an advertising campaign. For example, the advertiser may distribute the Eggs at a sponsored event such as at a concert or at a sports competition. Advertising server **1730** displays information about the campaign to the sponsor in ad management interface **1733**, through which the advertiser manages his campaign, adding new ads and deploying new content to customers who received their Eggs **1710** through the campaign.

[00169] For deployment of ads, an advertiser **1743**, **1745** or **1747** uploads the ads he wants to use in the advertising campaign to advertisement server **1730**, groups the ads into ad groups, defines rules specifying events that trigger playing of the ads, and activates the ads and their rules for deployment to the customers' Eggs. For deployment of music content, the advertiser uploads the music he wants to use in the advertising campaign, selects one or more rules to use with the music content, and activates the content and its rules for deployment to the sponsored customers' Eggs **1710**.

[00170] An embodiment of the present invention uses five types of objects; namely, (i) advertisements, (ii) ad groups, (iii) rules, (iv) content and (v) campaigns, all as described in detail hereinbelow with reference to **TABLES IV - XII**. Objects are reusable, so that, e.g., one advertisement can be used in multiple ad groups, one ad group can be used in multiple rules, and one rule can be used in multiple campaigns. As such, each object need only be created once, and can be reused with other objects. Each object as its own section in ad management interface **1735**, where the advertiser is able to add, modify and delete instances of the object.

[00171] An advertisement object includes an audio file, with a jingle or spoken words or both, that is to be played when an appropriate event occurs, or a video file for video-capable Eggs **1710**. In addition to the audio file, the advertisement object includes meta-data about the ad, such as whether to play the ad before, during or after a song, and information to display on the Egg's LCD screen while the ad is playing. The advertisement object section in ad management interface **1735** enables the advertiser to upload new ads, to edit current ads, and to delete old ads. **TABLE IV** indicates some data members of an advertising object.

TABLE IV: Advertising object data members

ad_id	Number
name	Text
description	Text
play_type	'BEFORE', 'DURING', 'AFTER'

screen_text	Text
screen_image_filespec	Text
ad_audio_filespec	Text

The member ad_audio_filespec is a location of the audio file on disk, and the member screen_image_filespec is a location of the file for the image that is displayed on the Egg's LCD screen when the ad is played. Similarly, the member screen_text is the text that is displayed on the LCD screen when the ad is played. The member play_type indicates when the ad should be played; before the song, during the song superposed on the audio, or after the song.

[00172] An ad group object is used to group ads together, and is useful in associating one rule with multiple ads. In accordance with an embodiment of the present invention, each ad in an ad group is assigned a probability frequency between 0 and 1, the frequencies adding up to one. The frequency assigned to an ad within an ad group determines the percentage of time that ad is played with a rule within the ad group is invoked. **TABLE V** indicates some data members of an ad group object, and **TABLE VI** indicates some data members of individual entries within an ad group object.

TABLE V: Ad group object data members	
ad_group_id	Number
name	Text
description	Text

TABLE VI: Ad group entry data members	
ad_group_id	Number
ad_id	Number
weighting	Number

[00173] A rule object is used to prescribe the conditions under which an ad or an ad group is played. A rule object includes a condition specifying when an ad should be played, and an ad or an ad group specifying which ads to play when the condition is satisfied. A rule object is of the general form

```
if condition = true
then play ad from ad group
```

[00174] In accordance with an embodiment of the present invention, rules are assigned priorities, which are used to determine while rule to execute in case two or more rule conditions are satisfied at once. A rule can also specify if another ad should be played after its ad is played.

[00175] A rule condition may include logical combinations of individual comparisons and tests. Individual comparisons and tests include inter alia

- current song ID = _____
- current song label ID = _____
- current song artist ID = _____
- current song album ID = _____
- current song genre ID = _____
- current weekday = _____
- number of rule invocations = _____
- current song purchase status = purchasable / non-purchasable
- current song's ownership = Purchase / Recorded / Try & Buy
- current time satisfies the condition _____
- current date satisfies the condition _____
- current song play count satisfies the condition _____
- time since first rule invocation satisfies the condition _____
- current ad / ad group has been played les than _____ times during the last _____ minutes / hours / days / songs

[00176] Each of the above comparisons and tests are made a run-time, i.e., at song play time. Each comparison and test evaluates to true or false, and multiple comparisons and tests can be logically combined to form a complex advertising rule condition. **TABLE VII** indicates some data members of a rule object.

TABLE VII: Rule object data members	
rule_id	Number
advertiser_id	Number
condition_id	Number
ad_group_id	Number
priority_level	Number
play_another_ad	yes/no
times_invoked	Number
first_invoked_timestamp	date/time
name	Text
description	Text

[00177] A content object represents new media that an advertiser wants to offer to a customer. Associated with the content is a set of rules that are also sent to the customer along with the content. The content object section of ad management interface **1735** enables the advertiser to upload a new song, to set its ownership to Owned or to Try & Buy, and to select one or more ad rules. **TABLE VIII** indicates some data members of a content object, and **TABLE IX** indicates joining of content with rules.

TABLE VIII: Content object data members	
content_id	Number
advertiser_id	Number
content_ownership	'OWNED', 'TRY & BUY'
content_filespec	Text
name	Text
description	Text

TABLE IX: Content joined with rules	
content_id	Number
rule_id	Number

[00178] A campaign object is used to deploy content and rules. An advertiser sets up a campaign for each group of media players that the advertiser distributes, such as one group of media players for a concert tour campaign, and another group of media players for a basketball team campaign. Each Egg player that the advertiser

distributes is associated with an appropriate campaign. As such, the advertiser can deploy ads and rules to a large targeted group of customers at once. The campaign object section of ad management interface **1735** enables advertisers to activate pre-defined rules and pre-uploaded content for a specific campaign. An advertiser may have multiple campaigns, and may re-use the same rules and content for two or more campaigns. **TABLE X** indicates some data members of a campaign object, **TABLE XI** indicates some data members of individual advertising content within a campaign object, and **TABLE XII** indicates some data members of individual rules within a campaign object.

TABLE X: Campaign object data members	
campaign_id	Number
advertiser_id	Number
player_id_range_start	Number
player_id_range_end	Number
name	Text
description	Text

TABLE XI: Campaign data members for content entries	
entry_id	Number
campaign_id	Number
content_id	Number

TABLE XII: Campaign data members for rule entries	
entry_id	Number
campaign_id	Number
rule_id	Number

[00179] After an advertiser deploys a campaign, advertising server **1730** tracks the campaign by monitoring inter alia the following statistics:

- number of users that received an ad or a piece of content;
- when the new ad or content was received on a customer's Egg;

- number of times a rule was invoked / an ad was played / an ad group was played;
- when a rule was invoked / an ad was played / an ad group was played; and
- number of times a user connected to receive new content.

Advertising server **1730** also enables an advertiser to simulate his campaign by running the campaign on simulated groups of customers, including inter alia:

- commuters, who listed to their Egg players during commute time;
- avid listeners, who listen to music multiple times a day;
- infrequent listeners, who listen to music randomly and infrequently; and
- classical music / rock & roll / rap fans, who play music of that genre.

If an advertiser, for example, sets too high of a priority for a rule that frequently gets invoked, then other rules and ads may not get played. A campaign simulation would detect such a problem before the advertiser deploys the campaign.

[00180] Advertising server **1730** includes a bulk ad provisioner **1731** for transmitting ad, ad groups and rules to host device **1720**. Transmission of ads from advertising server **1730** to host device **1720** may be performed in bulk for a plurality of players **1710**, or individually for an individual player **1710**, when player **1710** is being updated. Advertising server **1730** also includes its own rules engine **1737**, used for simulation of campaigns, as described hereinabove. Advertising server **1730** also includes a database of advertisers **1739**, advertisements, distribution rules and playback rules.

[00181] Host device **1720** includes an ad provisioner **1722** for transmitting ads to Egg player **1710**, and an ad updater for updating ads and rules on Egg player **1710**. Host device **1720** also includes a rules engine **1726** for evaluating conditions therefor and enforcing rules. Host device **1720** also includes a database **1728** of advertisements and rules.

[00182] Player **1710** includes a database **1718** of advertisements and rules. Player **1710** also includes an ad scheduler **1714**, for scheduling playback of ads in database **1718** according to their rules. Ad scheduler **1714** is invoked periodically, such as before a song is played. Ad scheduler **1714** evaluates rules to determine if ads should be played, and schedules their playback accordingly. If a rule involves an ad group, then ad scheduler **1714** selects one of the ads in the ad group based on the value of the ad's weighting data member from **TABLE VI**.

[00183] Player **1710** also includes an ad updater **1716** for updating ads, ad groups and rules in database **1718**.

[00184] Reference is now made to **FIG. 18**, which is a simplified flowchart of a method for scheduling advertisements according to evaluation of playback rules, used by ad scheduler **1714**, in accordance with an embodiment of the present invention. At operation 1805 the ad scheduler is invoked, and receives as input a reference to a current song and its play history. The ad scheduler generates a list of advertisements to be played as its output. At operation **1810** the ad scheduler initializes this list, as a currently empty list.

[00185] At operation **1815** the ad scheduler begins a loop traversing rules in order from highest priority to lowest priority. The loop spans operations **1820 – 1860**. At operation **1820** the ad scheduler determines if there are more rules to be processed. If not, then the loop ends, and the ad scheduler returns the list of ads at operation **1865** as its output. If there are more rules to be processed, then at operation **1825** the ad scheduler fetches the next rule. As mentioned hereinabove, each rule has a condition and an ad or an ad group. Since an ad can be considered as a special case of an ad group that contains a single ad with a weighting of 1, it is assumed in what follows that the rule involves an ad group.

[00186] At operation **1830** the ad scheduler evaluates the rule's condition. The condition may involve the song's play history, a reference to which was passed to the ad scheduler as input. At operation **1835** the ad scheduler branches depending

on whether the condition evaluated at operation **1830** is true or false. If the condition is false, then the rule is not applied and the ad scheduler returns to the beginning of the loop at operation **1820**. If the condition is true, then the rule is to be applied, and at operation **1840** the ad scheduler selects one of the ads from the ad group associated with the rule, based on the weightings assigned to the ads within the ad group. Such selection may be a random selection with the weightings used as probabilities, or it may be a deterministic selection in a manner such that the frequency of occurrence of each ad within the ad group is equal to, or approximately equal to, the ad's weighting.

[00187] At operation **1845** the ad scheduler inserts the ad chosen at operation **1840** at the end of the list of advertisements. At operation **1850** the ad scheduler updates the chosen rule's times_invoked data member as per **TABLE VII**. In addition, if this is the first time the rule is invoked, then the ad scheduler also updates the rule's first_invoked_timestamp data member as per **TABLE VII**. At operation **1855** the ad scheduler updates the chosen advertisement's play count. In addition, if this is the first time the chosen advertisement is played, then the ad scheduler also updates the advertisement's first played time.

[00188] At operation **1860** the ad scheduler checks if the rule's play_another_ad data member, as per **TABLE VII**, is true. If so, then the ad scheduler returns to operation **1820** to process the next rule. Otherwise, the ad scheduler terminates at operation **1865** and returns its list of advertisements as output.

[00189] It may thus be appreciated that the advertising system of **FIG. 17** provides for a wide range of advertising opportunities. One such opportunity is a pre-loaded demo, whereby a sponsor distributes branded promotional players with pre-loaded content and advertisements. A second such opportunity is a loyalty reward program, whereby loyal customers are given free songs with advertisements associated therewith. A third such opportunity is label promotion, whereby a music label company distributes free songs with associated advertisements at retail outlets. In

case of joint sponsors, advertisements from each sponsor can be organized, for example, into multiple ad groups and triggered in alternate succession.

[00190] As an example scenario, suppose company X sponsors a concert tour of rock band Y. Attendees of the concert receive a free Egg player with company X's logo imprinted on the Egg's casing. Pre-loaded on the Eggs is the latest album of rock band Y, in a digital rights managed WMA format, that the attendee receives for free. When the attendee plays the pre-loaded songs, he periodically hears advertisements for company X.

[00191] Company X uses ad management interface **1735** to update its advertisements from time to time. Company X offers new free songs of rock band Y as an incentive to have the attendees connect their Eggs to a host device, such as a kiosk or a home PC, and receive the new advertisements. When an attendee connects his Egg to the host device, he automatically receives the new songs and the new advertisements. In turn, his Egg sends statistical information about the advertisements he has heard to administration server **1730**.

[00192] Company X uses ad reporting & metrics interface **1733** to receive statistics about the number of ad impressions they are getting.

[00193] In accordance with an embodiment of the present invention, an application programming interface (API) for Eggs is provided, in order for third parties to use the advertising features of the present invention. Inter alia, the Egg API includes the following functions.

- `addAdvertisement(newAd)`

This function is used to add a new advertisement to an Egg's internal collection of advertisements.

- `addRule(newRule)`

This function is used to add a new rules to an Egg's internal collection of rules.

- `addAdGroup(newAdGroup)`

This function is used to add a new ad group to an Egg's internal collection of ad groups.

- `deleteAdvertisement(adID)`

This function is used to delete an old advertisement from an Egg's internal collection of advertisements.

- `deleteRule(ruleID)`

This function is used to delete an old rule from an Egg's internal collection of rules.

- `deleteAdGroup(adGroupID)`

This function is used to delete an old ad group from an Egg's internal collection of rules.

- `getAdvertisementList()`

This function is used to get a list of advertisement IDs from an Egg's internal collection of advertisements. This function is generally called while the Egg is connected to a host, to let the host know which advertisements the Egg already has loaded therewithin.

- `getRuleList()`

This function is used to get a list of rule IDs from an Egg's internal collection of advertisements. This function is generally called while the Egg is connected to a host, to let the host know which rules the Egg already has loaded therewithin.

- `getAdGroupList()`

This function is used to get a list of ad group IDs from an Egg's internal collection of advertisements. This function is generally called while the Egg is connected to a host, to let the host know which ad groups the Egg already has loaded therewithin.

- `shouldPlayAdvertisement(songID, artistID, albumID)`

This function is called before an Egg plays a song. The Egg evaluates the rules from its internal collection of rules, and determines if there is an advertisement that should be played. If so, then the Egg saves an internal note of which advertisement to play, and the function returns true. If not, then the function returns false.

- `getAdvertisementToPlay(adAudioData)`

This function is called after a successful call to `shouldPlayAdvertisement`. Based on the internal note that was saved, the function sets `adAudioData` to point to the start of the ad audio. In accordance with an embodiment of the present invention, adAudioData is located in a protected store, so that a customer cannot erase or modify it. This function returns the ID of the advertisement to play, and also updates the tracking information of the advertisement, ad group and rule that were involved in selecting the advertisement to be played.

- `getAdvertisementTrackingInfo()`

This function is used to get a list of times that advertisements were played. This function is generally called in order to get tracking information to send to a host, for the host to send to the advertising server.

- `clearAdvertisementTrackingInfo()`

This function is used to clear advertisement tracking information after the information is successfully uploaded to the advertising server, and is generally called to prevent the same ad impressions from being counted more than once.

- `getTime()`

This function is used to get the current time from an Egg's clock.

- `setTime(newTime)`

This function is used t set the current time in an Egg's clock.

- `getDeviceID()`

This function is used to get an Egg's unique ID.

[00194] In addition to the API for Eggs provided hereinabove, an API for hosts, including kiosks, Nests and personal computers, is also provided, in order for third parties to use the advertising features of the present invention. Inter alia, the host API includes the following functions.

- `updateDeviceAds(deviceID, newAds, newAdGroups, newRules, delAds, delAdGroups, delRules)`

This function is used to communicate with the advertising server and check whether there are new ads, new rules and new ad groups for the specified customer Egg. The ads, rules and ad groups that the host retrieves will be automatically placed onto the customer's Egg, without prompting the customer. This function is also used to communicate ads, rules and ad groups that are to be deleted from the customer's Egg. The advertising server determines which campaign the customer's Egg belongs to, and sends or deletes ads, rules and ad groups accordingly.

- `getNewContentOffers(deviceID, newAds, newAdGroups, newRules, newContent)`

This function checks with the advertising server whether there is new content being offered for the host that makes the function call, or for the specified customer Egg. The retrieved content is then offered by the host to the customer. If the customer accepts the host's offer, then the advertisements, ad groups, rules and content are placed onto the customer's Egg. The advertising server determines which campaign the customer's Egg belongs to, and sends ads, ad groups and rules accordingly.

- `sendTrackingInfo(trackingInfo)`

This function is used to send tracking information, including advertisement play history, to the advertising server. If successful in sending the data, the function returns true; otherwise, it returns false.

- `putAdvertisement(newAd)`

This function sends an advertisement to the host.

- `putRule(newRule)`

This function sends a rule to the host.

- `putAdGroup(newAdGroup)`

This function sends an ad group to the host.

- `putContent(newContent)`

This function sends content to the Nest.

- `getHostID()`

This function gets the unique ID assigned to the host.

- `addAddPlayToHistory()`

This function adds information to an Egg's internal ad playback history when an advertisement is played.

[00195] In the foregoing specification, the invention has been described with reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made to the specific exemplary embodiments without departing from the broader spirit and scope of the invention. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

CLAIMS

What is claimed is:

1. A system for enabling a user to listen to songs on a network-enabled device, comprising:

a network-enabled device, comprising:

an embedded receiver for receiving at least one song list, and for receiving music streamed over a wireless network;

list navigation software, for navigating the at least one song list and selecting a desired song therefrom, using a keypad communicatively coupled with the network-enabled device;

an embedded transmitter for transmitting a song selection to a tracking server; and

an embedded audio player, for playing the music streamed to the network-enabled device over the wireless network;

a tracking server, comprising:

a data store comprising at least one song list;

a receiver for receiving a song selection from said network-enabled device, the song selection comprising an ID for a selected song; and

a transmitter for transmitting the at least one song list to said network-enabled device, and for transmitting the received song selection to a media server; and

a media server, comprising:

a data store comprising audio files for the songs listed in the song list;

an audio streamer;

a receiver for receiving an instruction from said tracking server to transmit the selected song to said network-enabled device; and

a transmitter for streaming the selected song to said network-enabled device.

2. The system of claim 1 wherein said tracking server receives the at least one song list from a user's media management device.

3. The system of claim 2 further comprising a scanner for scanning the user's media management device to identify the at least one song list.

4. The system of claim 3 wherein the user's media management device is a PC computer.

5. The system of claim 1 wherein said tracking server further comprises an account validator, for determining whether or not a user account is currently valid.

6. The system of claim 1 wherein said tracking server further comprises a song validator, for determining whether or not a user's digital rights management license for the selected song has expired.

7. The system of claim 1 wherein said network-enabled device is a cellular telephone.

8. The system of claim 1 wherein said network-enabled device is a public network access device.

9. A method for a network-enabled device to play songs, comprising:

transmitting a play request from a network-enabled device to a tracking server;

receiving at least one song list from the tracking server;

providing a user interface that enables a user to navigate the at least one song list and to select a desired song, using a keypad communicatively coupled with the network-enabled device;

transmitting an ID of the selected song to the tracking server;

receiving streamed audio data for the selected song from a media server; and

playing the streamed audio data on an audio player embedded in the network-enabled device.

10. A method for a tracking server to cause music to be streamed to a network-enabled device, comprising:

receiving a play request from a network-enabled device;

sending at least one song list to the network-enabled device, in response to the received play request;

receiving a selection request from the network-enabled device with an ID for a selected song; and

sending an instruction to a media server to stream the selected song to the network-enabled device.

11. The method of claim **10** further comprising validating a user account prior to said sending a song list.

12. The method of claim **10** further comprising validating a user's digital rights management license for the selected song, prior to said sending an instruction.

13. The method of claim **10** further comprising receiving the at least one song list from a user's media management device.

14. The method of claim **13** wherein the user's media management device is a PC computer.

15. The method of claim **10** wherein the network-enabled device is a cellular telephone.

16. The method of claim **10** wherein the network-enabled device is a public network access device.

17. A system for enabling a user to listen to songs on a network-enabled device, comprising:

a network-enabled device, comprising:

an embedded receiver for receiving music streamed over a wireless network;

list navigation software, for navigating at least one song list and selecting a desired song therefrom, using a keypad communicatively coupled with the network-enabled device;

an embedded transmitter for transmitting the song selection to a tracking server; and

an embedded audio player, for playing the music streamed to the network-enabled device over the wireless network;

a tracking server, comprising:

a receiver for receiving a song selection from said network-enabled device, the song selection comprising an ID for a selected song; and

a transmitter for transmitting the received song selection to a media server; and

a media server, comprising:

a data store comprising audio files for the songs listed in the song list;

an audio streamer;

a receiver for receiving an instruction from said tracking server to transmit the selected song to said network-enabled device; and

a transmitter for streaming the selected song to said network-enabled device.

18. The system of claim **17** wherein said tracking server further comprises an account validator, for determining whether or not a user account is currently valid.

19. The system of claim **17** wherein said tracking server further comprises a song validator, for determining whether or not a user's digital rights management license for the selected song has expired.

20. The system of claim **17** wherein said network-enabled device is a cellular telephone.

21. The system of claim **17** wherein said network-enabled device is a public network access device.

22. A method for a network-enabled device to play songs, comprising:

providing a user interface that enables a user to navigate at least one song list and to select a desired song, using a keypad communicatively coupled with a network-enabled device;

transmitting an ID of the selected song to a tracking server;

receiving streamed audio data for the selected song from a media server; and

playing the streamed audio data on an audio player embedded in the network-enabled device.

23. A method for a tracking server to cause music to be streamed to a network-enabled device, comprising:

receiving a selection request from a network-enabled device with an ID for a selected song; and

sending an instruction to a media server to stream the selected song to the network-enabled device.

24. The method of claim **23** further comprising validating a user's digital rights management license for the selected song, prior to said sending an instruction.

25. The method of claim **23** wherein the network-enabled device is a cellular telephone.

26. The method of claim **23** wherein the network-enabled device is a public network access device.

27. A system for deploying advertisements on portable music players, comprising:

a portable music player, comprising:

a database of audio advertisements and playback rules therefor, wherein playback rules are used to govern when to play advertisements;

an ad updater for periodically receiving advertisements and playback rules; and

an ad scheduler for scheduling playback of advertisements in accordance with their playback rules;

a host device that is periodically communicatively coupled with said portable music player, comprising:

a database of audio advertisements and playback rules therefor;

an ad provisioner for transferring ads and playback rules to said portable music player, when said portable music player is communicatively coupled with the host device;

an ad updater for receiving advertisements and playback rules from time to time; and

an advertising server that is communicatively coupled with said host device, comprising:

a database of information about advertisers and their advertising campaigns, and for storing audio advertisements, distribution rules therefor and playback rules therefor;

an ad provisioner for transferring ads and playback rules to said host device; and

a web interface for receiving advertisements and playback rules for an advertising campaign, from an advertiser's computer.

28. The system of claim **27** wherein said advertising server further comprises a tracking interface for providing to the advertiser's computer tracking information about deployment of advertisements in said portable music player.

29. A portable music player, comprising:

a database of audio advertisements and playback rules therefor, wherein the playback rules are used to govern when to play the advertisements, and wherein each one of the playback rules comprises a condition and an advertisement, or a condition and a plurality of advertisements;

an ad updater for receiving advertisements and playback rules related to an advertising campaign;

an ad scheduler for periodically evaluating the playback rule conditions, and for scheduling playback of the advertisements in accordance with the playback rules; and

a tracking engine for maintaining a history of advertisements played, and for periodically uploading the history to a server computer and clearing the history thereafter.

30. The portable music player of claim **29** wherein at least one playback rule associates an advertisement with a song stored in said portable music player.

31. The portable music player of claim **29** wherein at least one playback rule is an expiration event for an advertisement.

32. The portable music player of claim **29** wherein at least one playback rule assigns frequencies of playback to a plurality of advertisement.

33. The portable music player of claim **29** wherein playback rules comprise priorities, the priorities being used to discriminate which of a plurality of playback rules to use when the conditions of the plurality of playback rules are simultaneously satisfied.

34. A method for deploying advertisements within portable music players, comprising:

uploading a plurality of audio advertisements and a plurality of playback rules to a server computer, the plurality of advertisements and the plurality of playback rules being designated for deployment in a plurality of portable music players, wherein playback rules are used to govern when to play advertisements;

transmitting the plurality of advertisements and the plurality of playback rules to a host device into which at least one of the plurality of portable music players is periodically docked;

transmitting at least one advertisement and at least one playback rule from the host device to each of at least one portable music players, when such portable music player is docked in the host device;

periodically evaluating at least one playback rule, in each of the plurality of portable music players; and

playing at least one advertisement according to said periodically evaluating, in each of the plurality of portable music players.

35. The method of claim **34** wherein at least one playback rule associates an advertisement with a song stored in a portable music player.

36. The method of claim **34** wherein at least one playback rule defines an expiration event for an advertisement.

37. The method of claim **34** wherein at least one playback rule assigns frequencies of playback to plurality of advertisements.

38. The method of claim **34** wherein playback rules include priorities, and wherein said periodically evaluating uses the priorities to discriminate which of a plurality of playback rules to use when the plurality of playback rules are simultaneously obeyed.

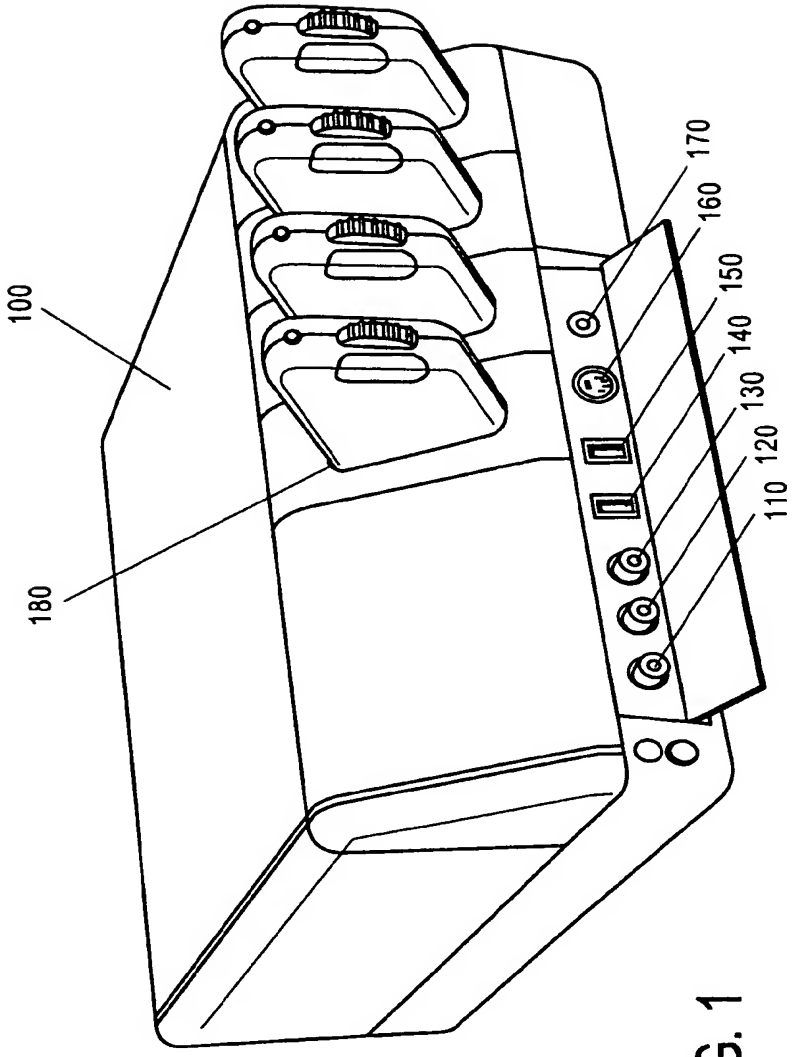

FIG. 1

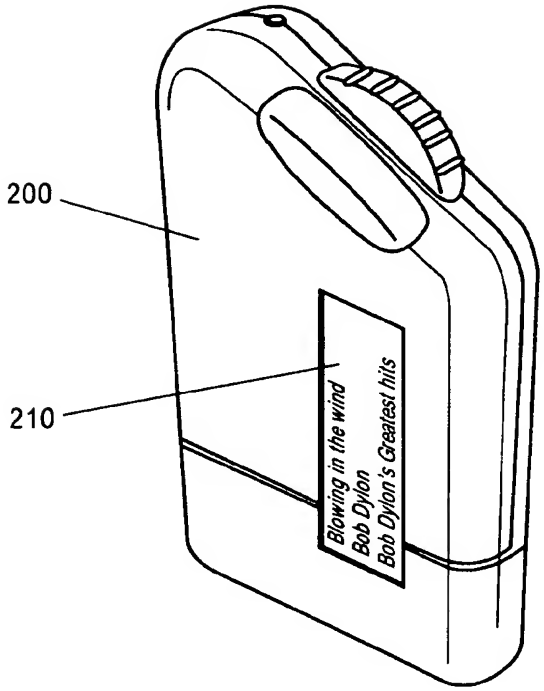
200
210
Blowing in the wind
Bob Dylon
Bob Dylon's Greatest hits

FIG. 2

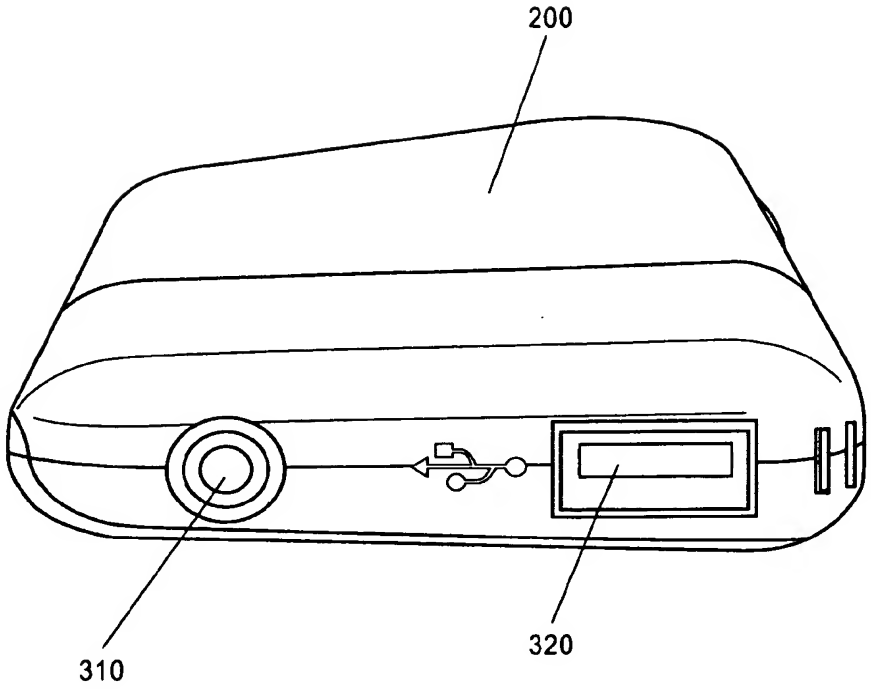

FIG. 3

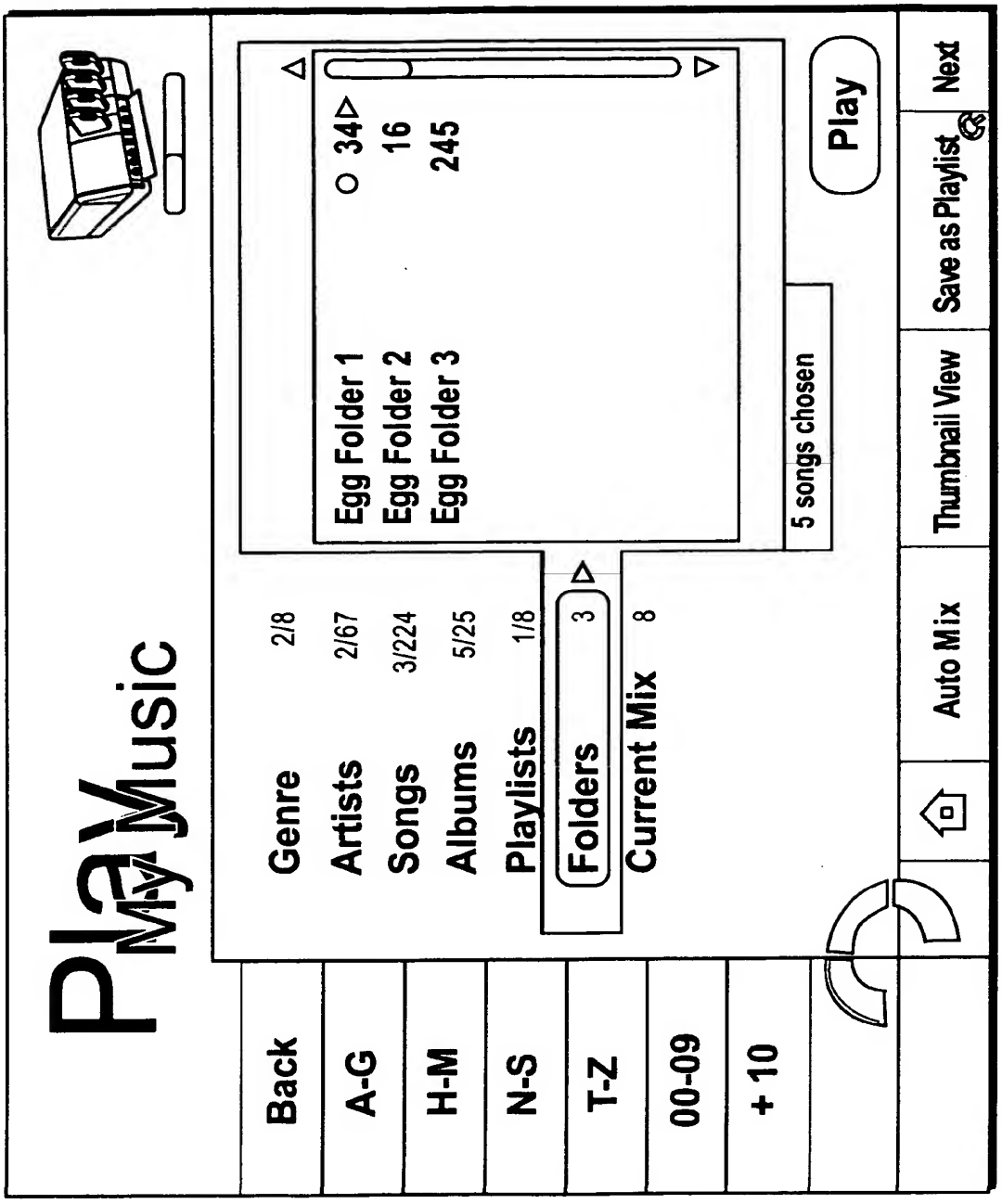
Play My Music
Genre 2/8
Artists 2/67
Songs 3/224
Albums 5/25
Playlists 1/8
Folders 3
Current Mix 8
Egg Folder 1
Egg Folder 2
Egg Folder 3
34
16
245
5 songs chosen
Play
Back
A-G
H-M
N-S
T-Z
00-09
+ 10
Auto Mix
Thumbnail View
Save as Playlist
Next

FIG. 4

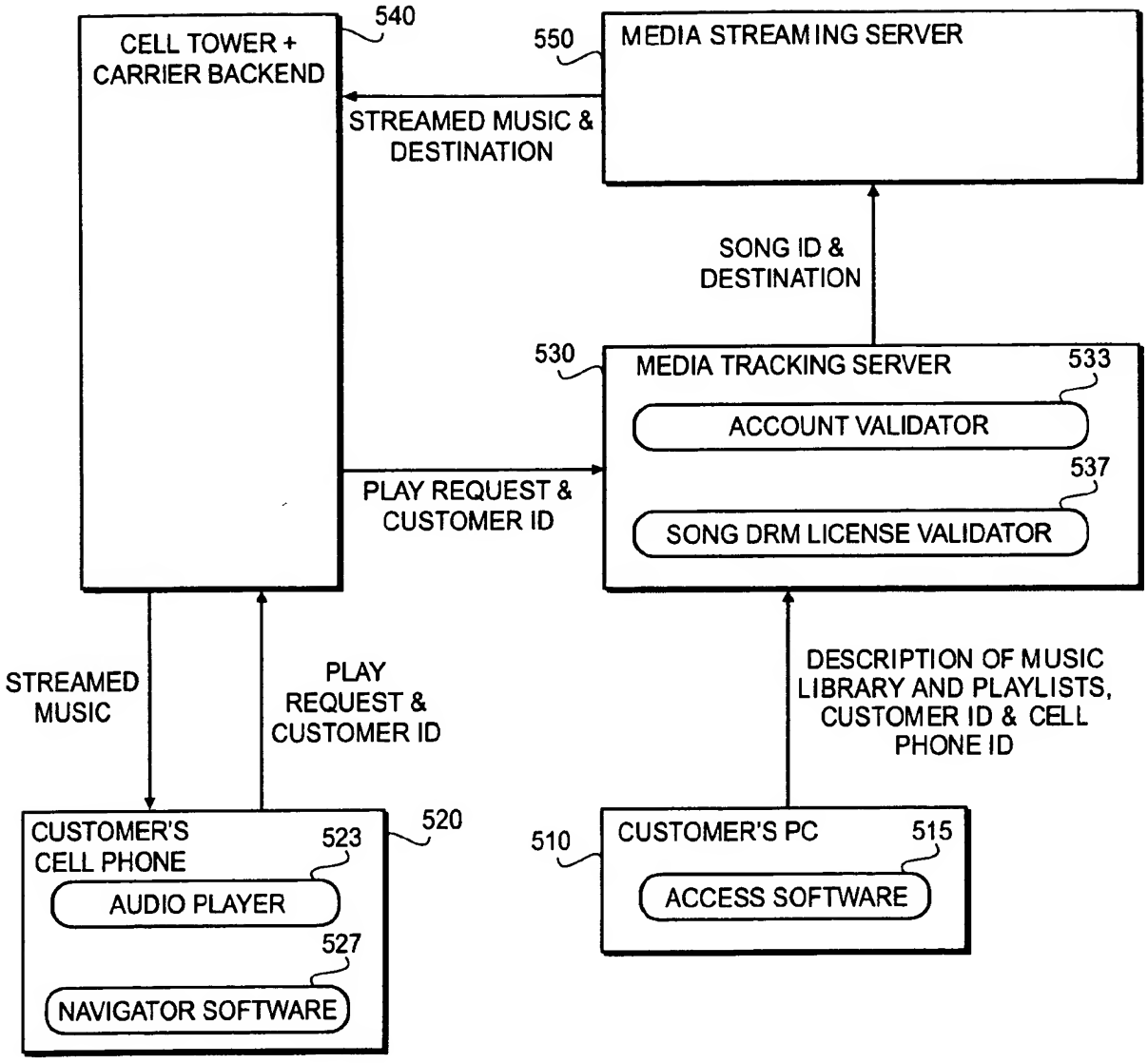
CELL TOWER + CARRIER BACKEND
540
MEDIA STREAMING SERVER
550
STREAMED MUSIC & DESTINATION
SONG ID & DESTINATION
MEDIA TRACKING SERVER
530
533
ACCOUNT VALIDATOR
537
SONG DRM LICENSE VALIDATOR
PLAY REQUEST & CUSTOMER ID
STREAMED MUSIC
PLAY REQUEST & CUSTOMER ID
DESCRIPTION OF MUSIC LIBRARY AND PLAYLISTS, CUSTOMER ID & CELL PHONE ID
CUSTOMER'S CELL PHONE
520
523
AUDIO PLAYER
527
NAVIGATOR SOFTWARE
510
CUSTOMER'S PC
515
ACCESS SOFTWARE

FIG. 5

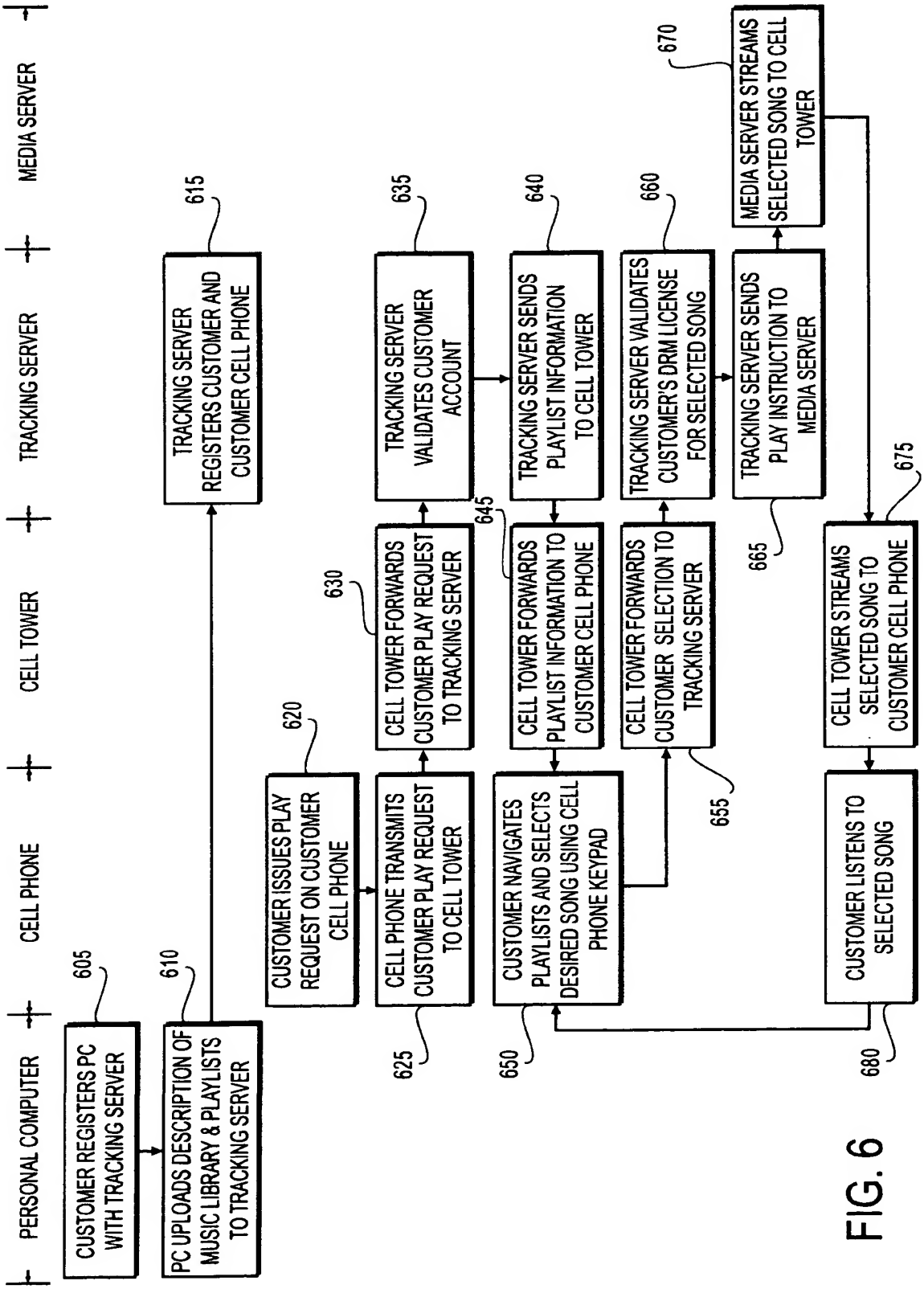
PERSONAL COMPUTER
CELL PHONE
CELL TOWER
TRACKING SERVER
MEDIA SERVER
CUSTOMER REGISTERS PC WITH TRACKING SERVER
605
PC UPLOADS DESCRIPTION OF MUSIC LIBRARY & PLAYLISTS TO TRACKING SERVER
610
TRACKING SERVER REGISTERS CUSTOMER AND CUSTOMER CELL PHONE
615
CUSTOMER ISSUES PLAY REQUEST ON CUSTOMER CELL PHONE
620
CELL PHONE TRANSMITS CUSTOMER PLAY REQUEST TO CELL TOWER
625
CELL TOWER FORWARDS CUSTOMER PLAY REQUEST TO TRACKING SERVER
630
TRACKING SERVER VALIDATES CUSTOMER ACCOUNT
635
TRACKING SERVER SENDS PLAYLIST INFORMATION TO CELL TOWER
640
CELL TOWER FORWARDS PLAYLIST INFORMATION TO CUSTOMER CELL PHONE
645
CUSTOMER NAVIGATES PLAYLISTS AND SELECTS DESIRED SONG USING CELL PHONE KEYPAD
650
CELL TOWER FORWARDS CUSTOMER SELECTION TO TRACKING SERVER
655
TRACKING SERVER VALIDATES CUSTOMER'S DRM LICENSE FOR SELECTED SONG
660
TRACKING SERVER SENDS PLAY INSTRUCTION TO MEDIA SERVER
665
MEDIA SERVER STREAMS SELECTED SONG TO CELL TOWER
670
CELL TOWER STREAMS SELECTED SONG TO CUSTOMER CELL PHONE
675
CUSTOMER LISTENS TO SELECTED SONG
680

FIG. 6

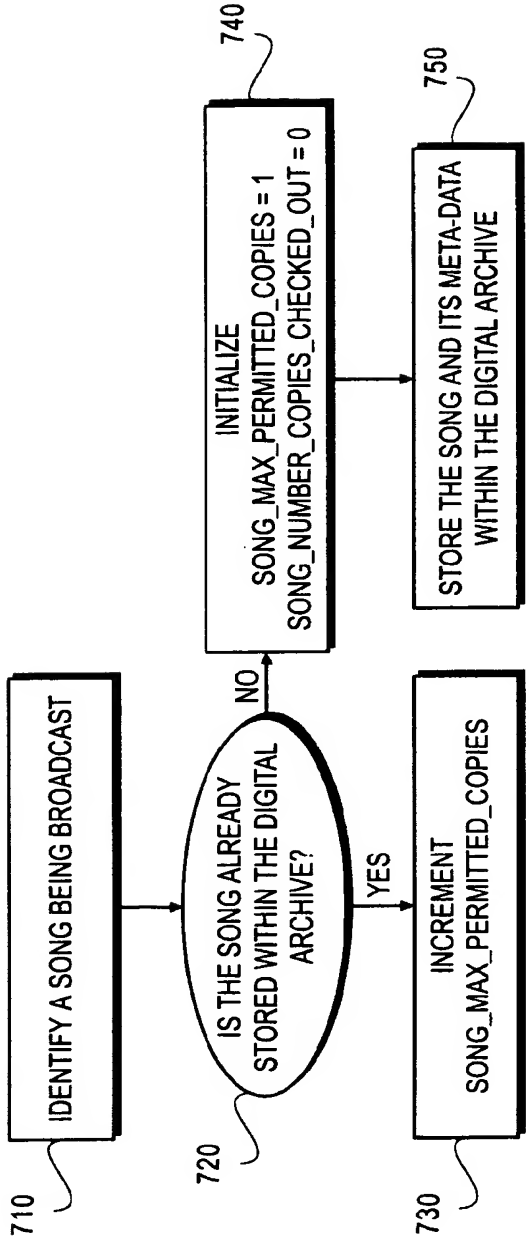
710
IDENTIFY A SONG BEING BROADCAST
720
IS THE SONG ALREADY STORED WITHIN THE DIGITAL ARCHIVE?
NO
YES
730
INCREMENT SONG_MAX_PERMITTED_COPIES
740
INITIALIZE SONG_MAX_PERMITTED_COPIES = 1 SONG_NUMBER_COPIES_CHECKED_OUT = 0
750
STORE THE SONG AND ITS META-DATA WITHIN THE DIGITAL ARCHIVE

FIG. 7

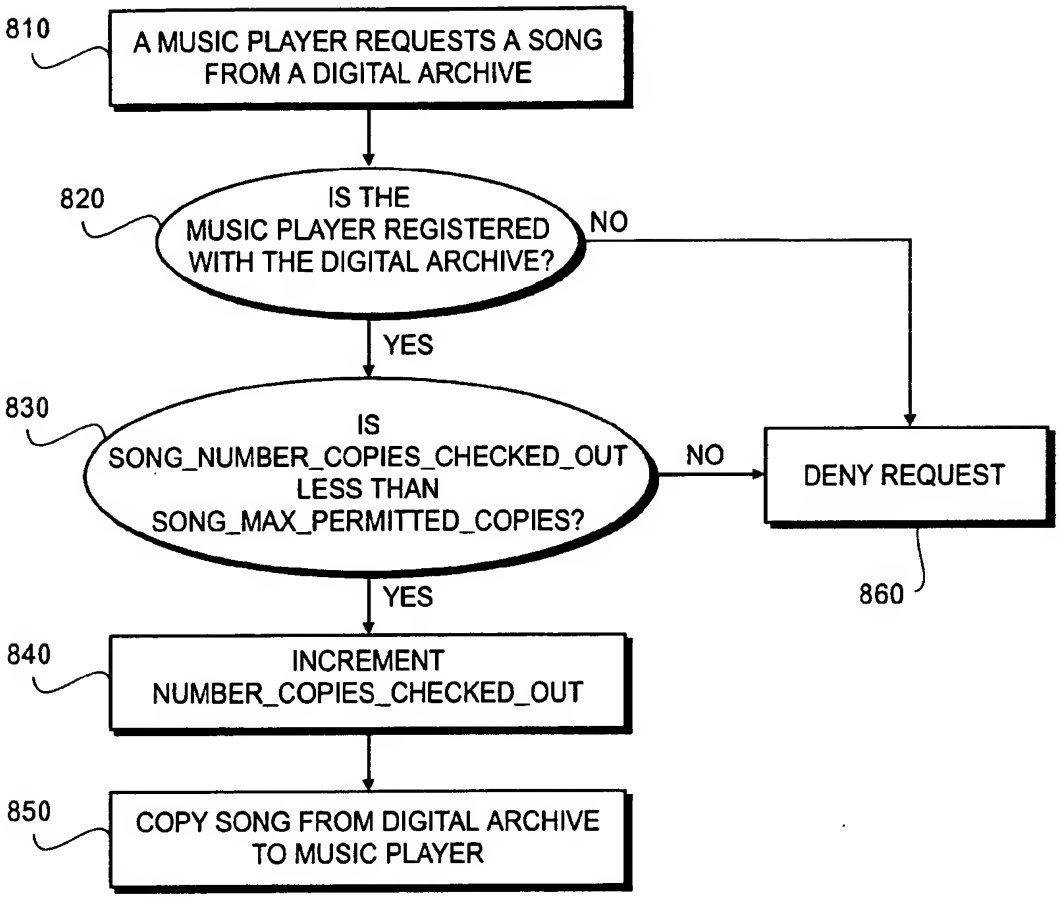
810
A MUSIC PLAYER REQUESTS A SONG FROM A DIGITAL ARCHIVE
820
IS THE MUSIC PLAYER REGISTERED WITH THE DIGITAL ARCHIVE?
NO
YES
830
IS SONG_NUMBER_COPIES_CHECKED_OUT LESS THAN SONG_MAX_PERMITTED_COPIES?
NO
DENY REQUEST
860
YES
840
INCREMENT NUMBER_COPIES_CHECKED_OUT
850
COPY SONG FROM DIGITAL ARCHIVE TO MUSIC PLAYER

FIG. 8

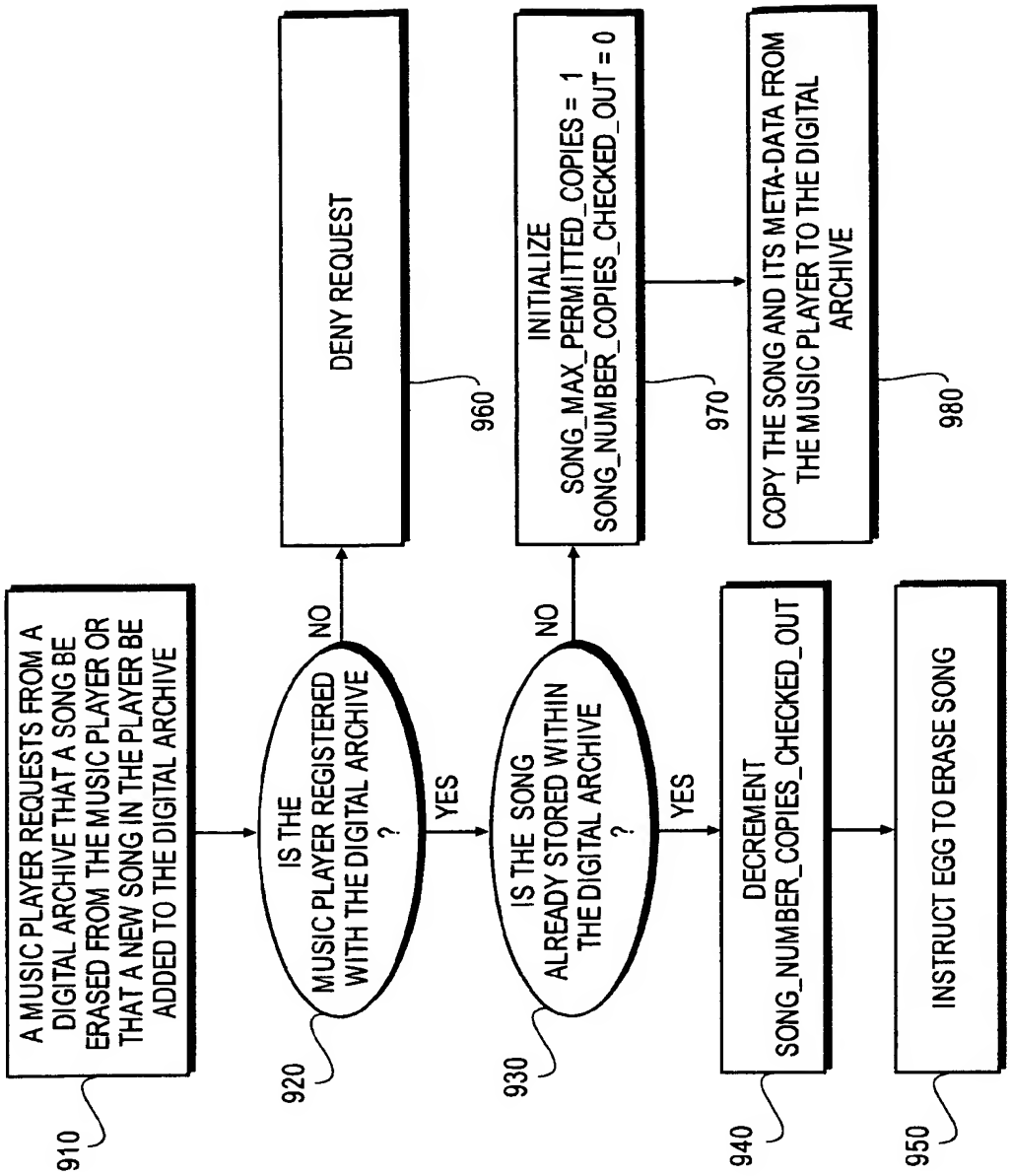
A MUSIC PLAYER REQUESTS FROM A DIGITAL ARCHIVE THAT A SONG BE ERASED FROM THE MUSIC PLAYER OR THAT A NEW SONG IN THE PLAYER BE ADDED TO THE DIGITAL ARCHIVE
910
IS THE MUSIC PLAYER REGISTERED WITH THE DIGITAL ARCHIVE ?
920
NO
YES
DENY REQUEST
960
IS THE SONG ALREADY STORED WITHIN THE DIGITAL ARCHIVE ?
930
NO
YES
INITIALIZE SONG_MAX_PERMITTED_COPIES = 1 SONG_NUMBER_COPIES_CHECKED_OUT = 0
970
DECREMENT SONG_NUMBER_COPIES_CHECKED_OUT
940
COPY THE SONG AND ITS META-DATA FROM THE MUSIC PLAYER TO THE DIGITAL ARCHIVE
980
INSTRUCT EGG TO ERASE SONG
950

FIG. 9

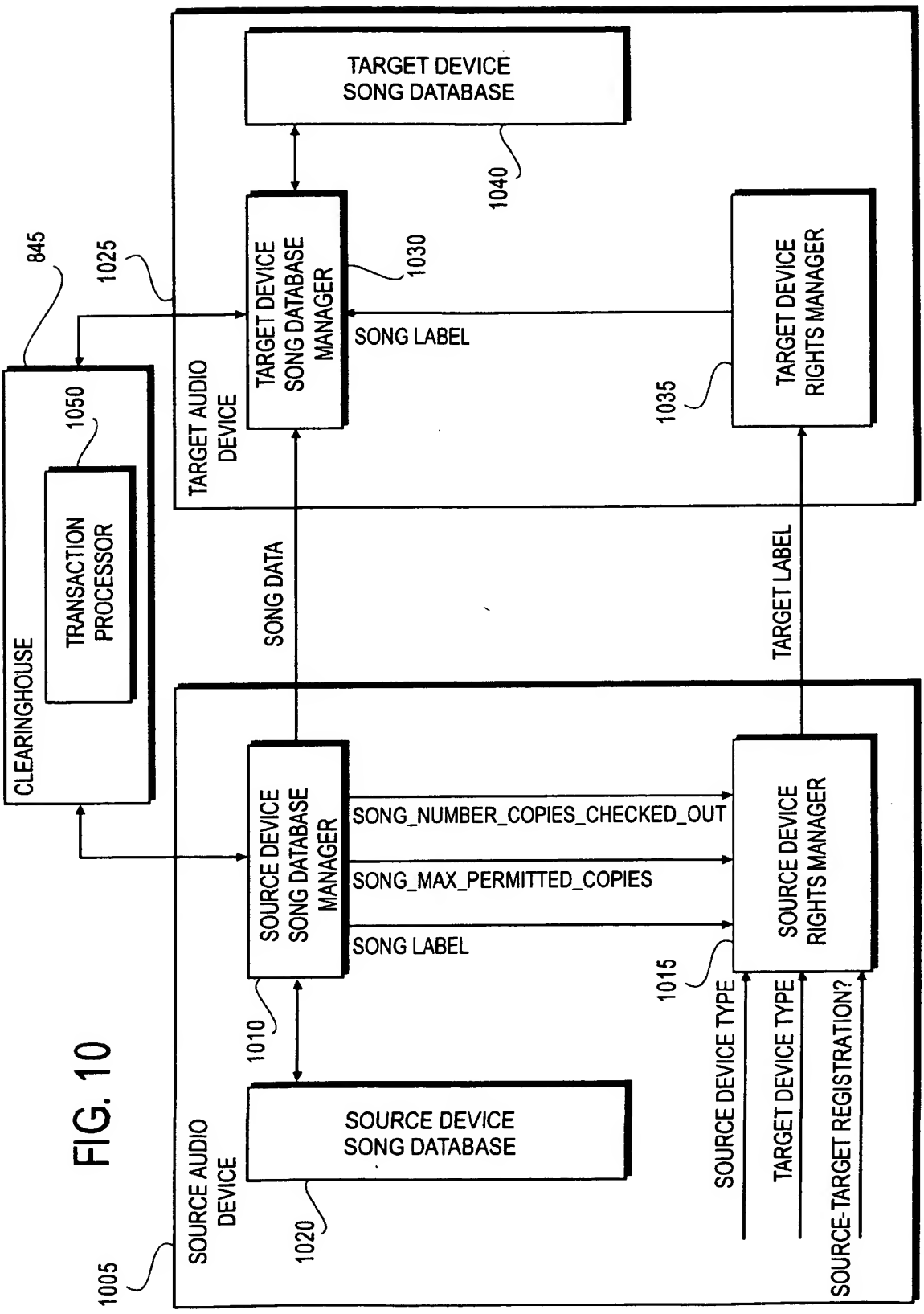
TARGET DEVICE SONG DATABASE
1040
TARGET DEVICE SONG DATABASE MANAGER
1030
TARGET AUDIO DEVICE
1025
845
SONG LABEL
TARGET DEVICE RIGHTS MANAGER
1035
1050
TRANSACTION PROCESSOR
CLEARINGHOUSE
SONG DATA
TARGET LABEL
SOURCE DEVICE SONG DATABASE MANAGER
SONG_NUMBER_COPIES_CHECKED_OUT
SONG_MAX_PERMITTED_COPIES
SONG LABEL
SOURCE DEVICE RIGHTS MANAGER
1015
1010
SOURCE DEVICE TYPE
TARGET DEVICE TYPE
SOURCE-TARGET REGISTRATION?
SOURCE DEVICE SONG DATABASE
1020
SOURCE AUDIO DEVICE
1005

FIG. 10

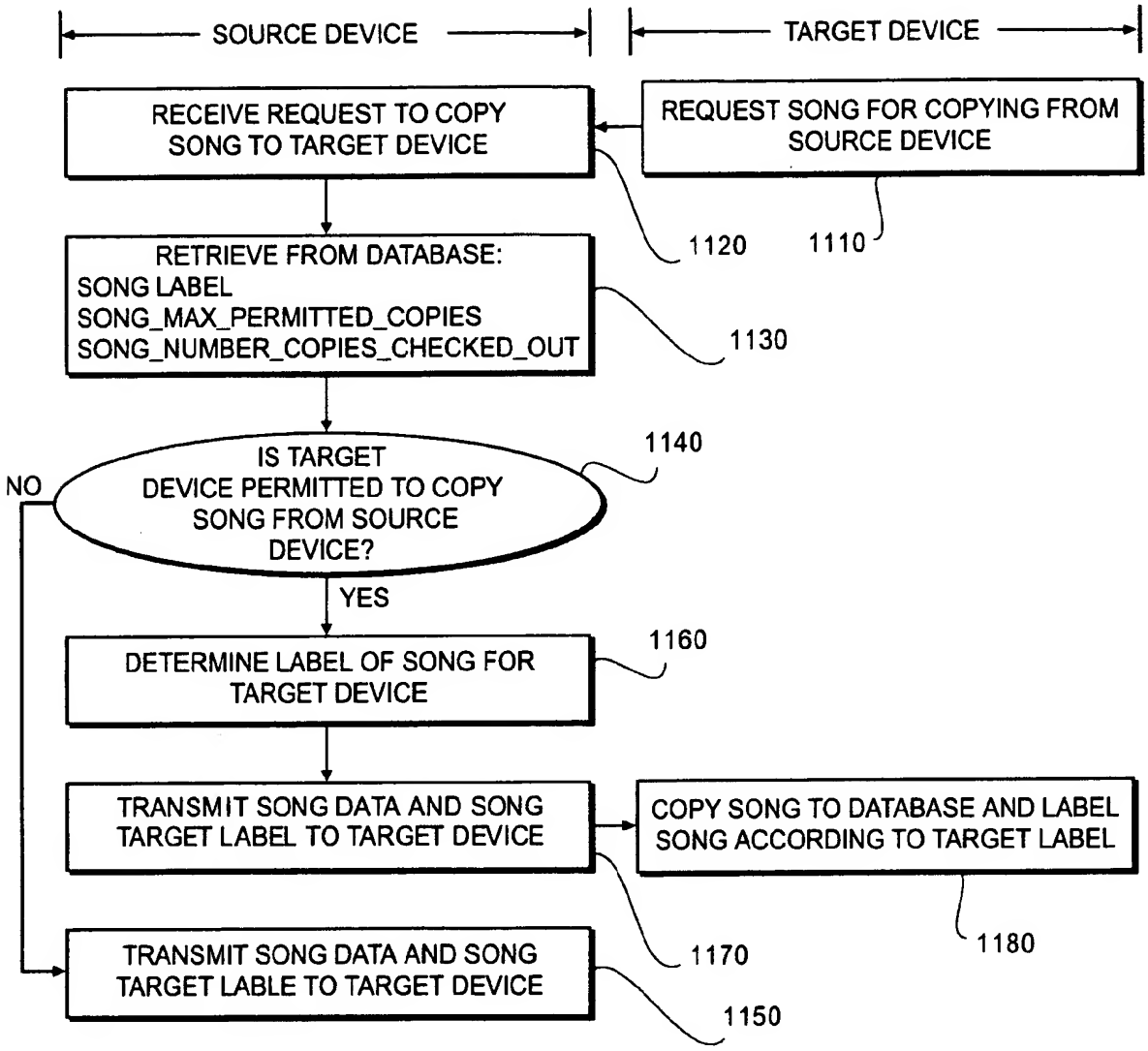
SOURCE DEVICE
TARGET DEVICE
RECEIVE REQUEST TO COPY SONG TO TARGET DEVICE
REQUEST SONG FOR COPYING FROM SOURCE DEVICE
1120
1110
RETRIEVE FROM DATABASE:
SONG LABEL
SONG_MAX_PERMITTED_COPIES
SONG_NUMBER_COPIES_CHECKED_OUT
1130
IS TARGET DEVICE PERMITTED TO COPY SONG FROM SOURCE DEVICE?
1140
NO
YES
DETERMINE LABEL OF SONG FOR TARGET DEVICE
1160
TRANSMIT SONG DATA AND SONG TARGET LABEL TO TARGET DEVICE
COPY SONG TO DATABASE AND LABEL SONG ACCORDING TO TARGET LABEL
1170
1180
TRANSMIT SONG DATA AND SONG TARGET LABLE TO TARGET DEVICE
1150

FIG. 11

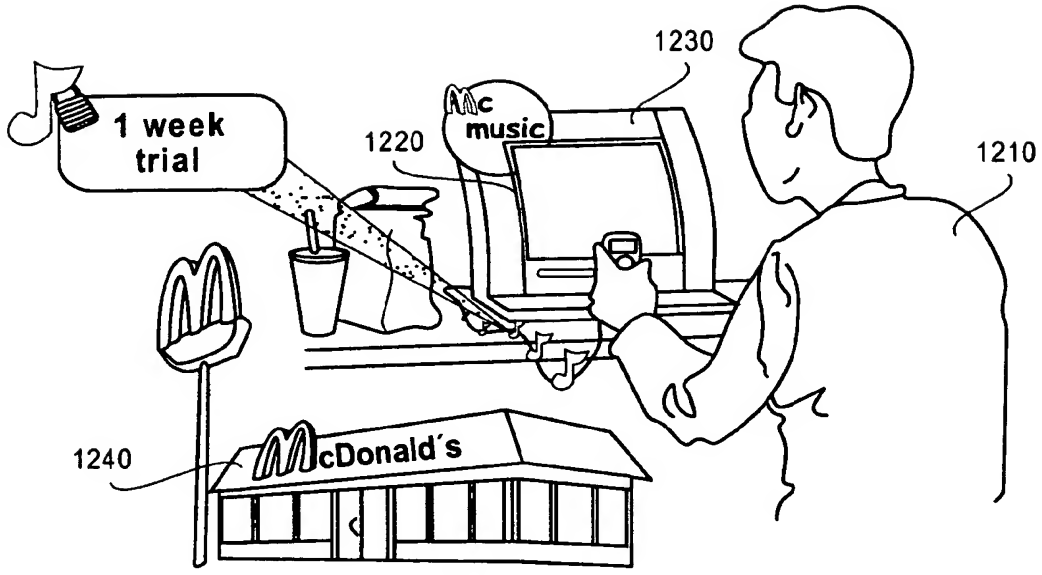

FIG. 12A

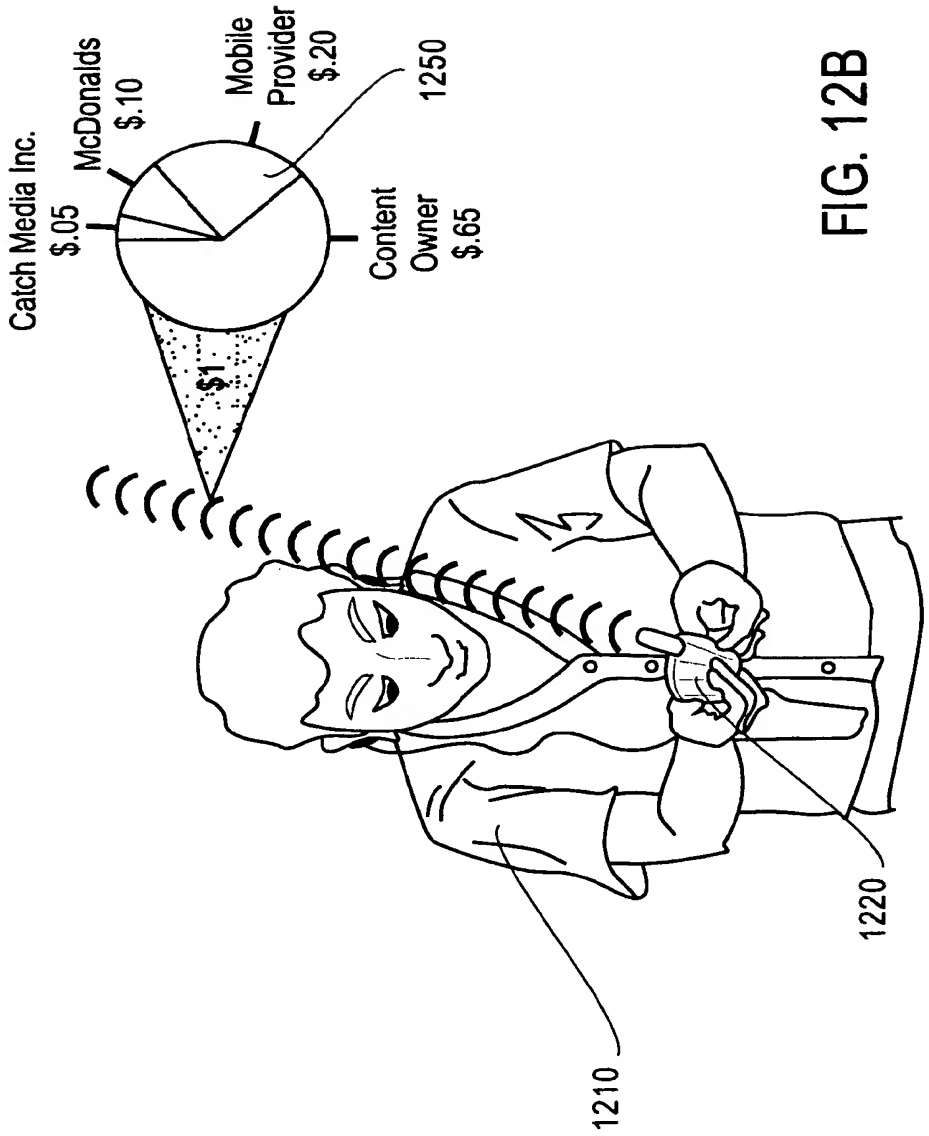
Catch Media Inc.
$.05
McDonalds
$.10
Mobile
Provider
$.20
1250
Content
Owner
$.65
$1
1210
1220

FIG. 12B

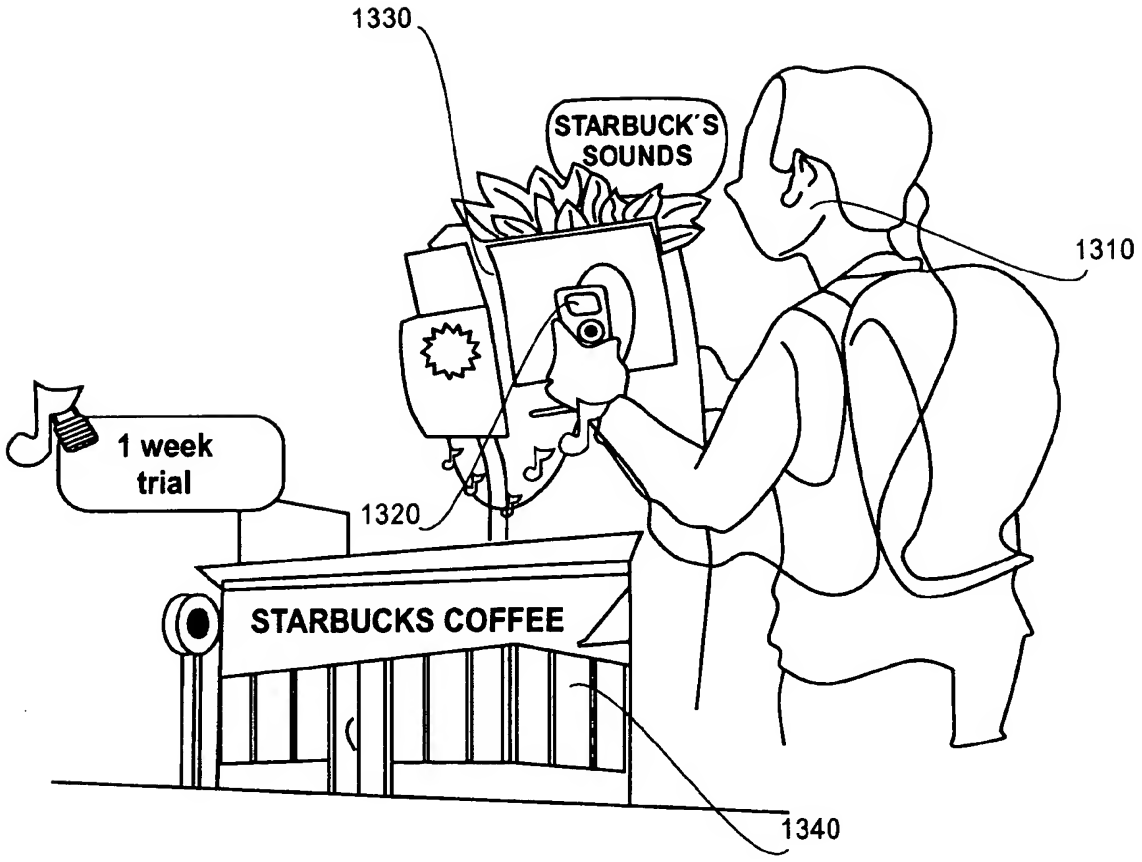
1330
STARBUCK'S SOUNDS
1310
1 week trial
1320
STARBUCKS COFFEE
1340

FIG. 13A

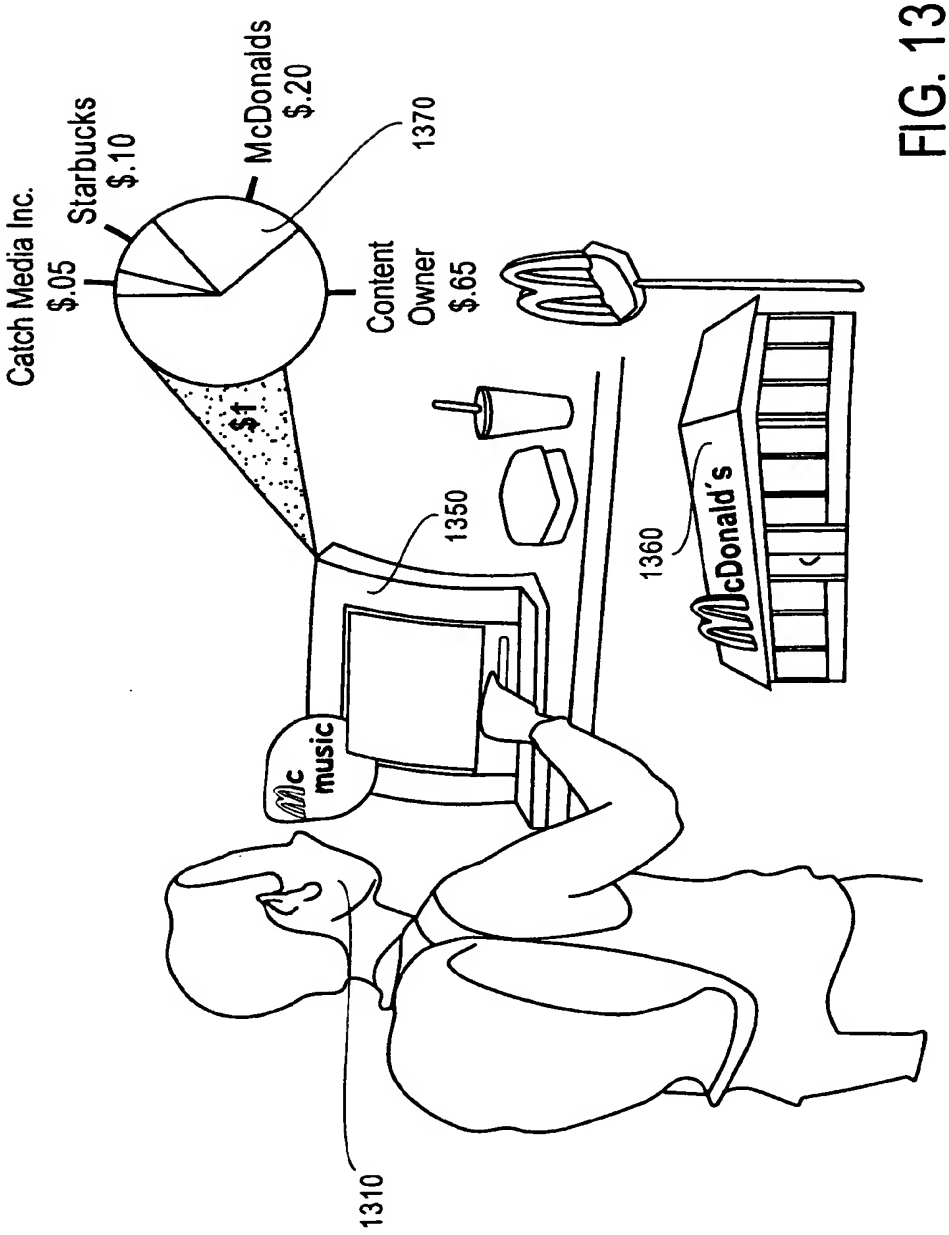
Catch Media Inc.
$.05
Starbucks
$.10
McDonalds
$.20
Content
Owner
$.65
$1
1370
1350
1360
1310
Mc
music
McDonald's

FIG. 13B

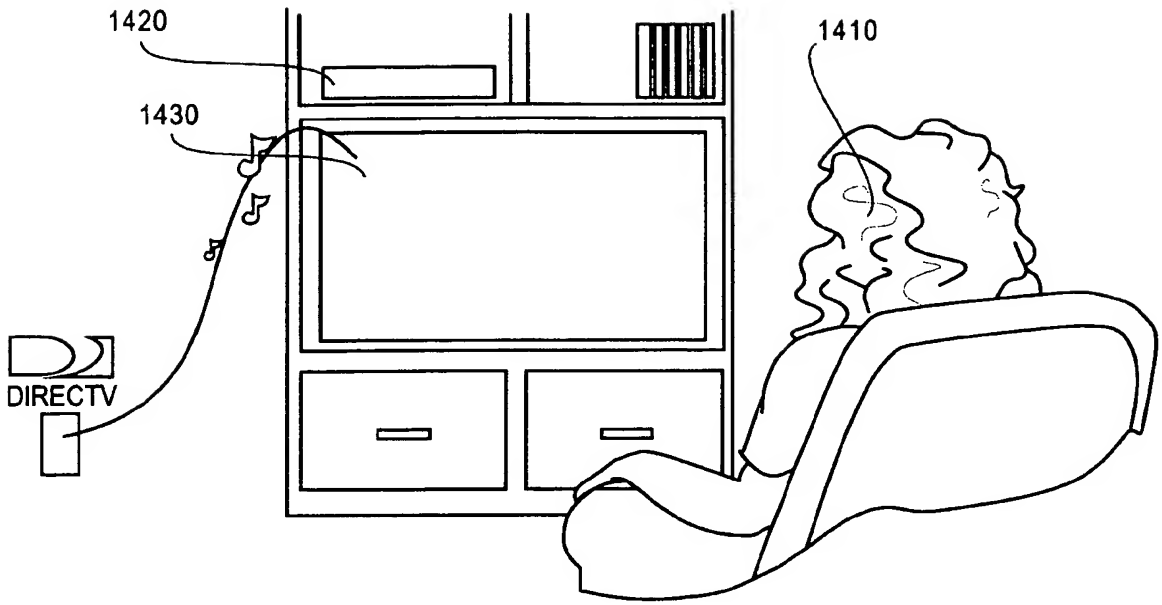

FIG. 14A

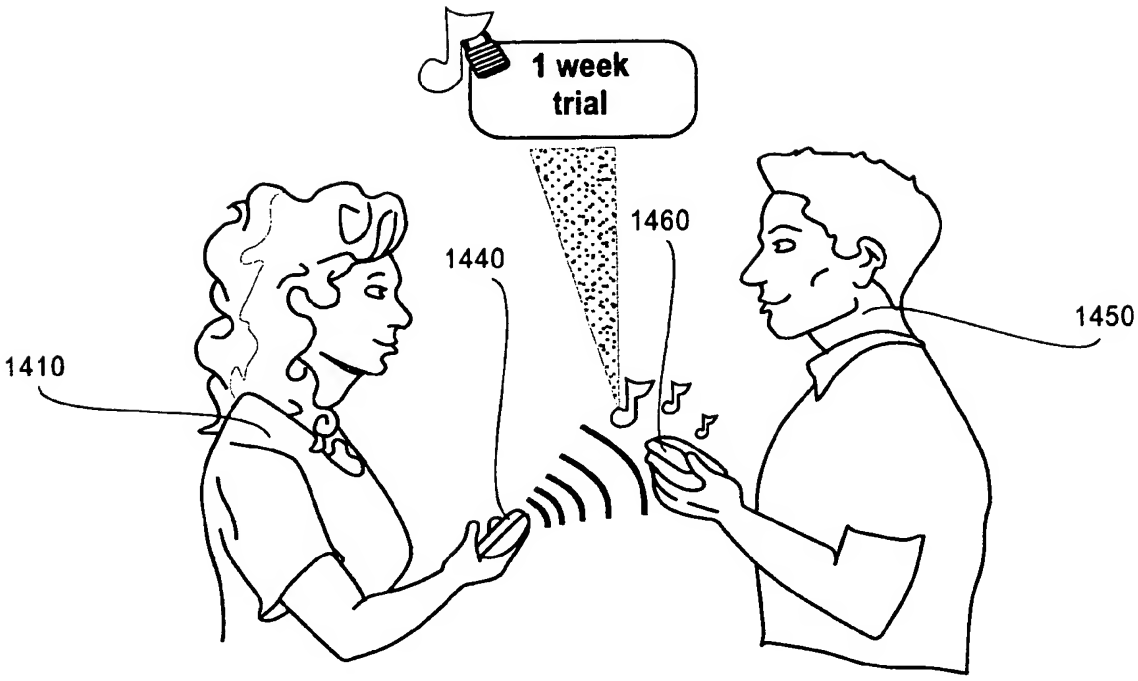

FIG. 14B

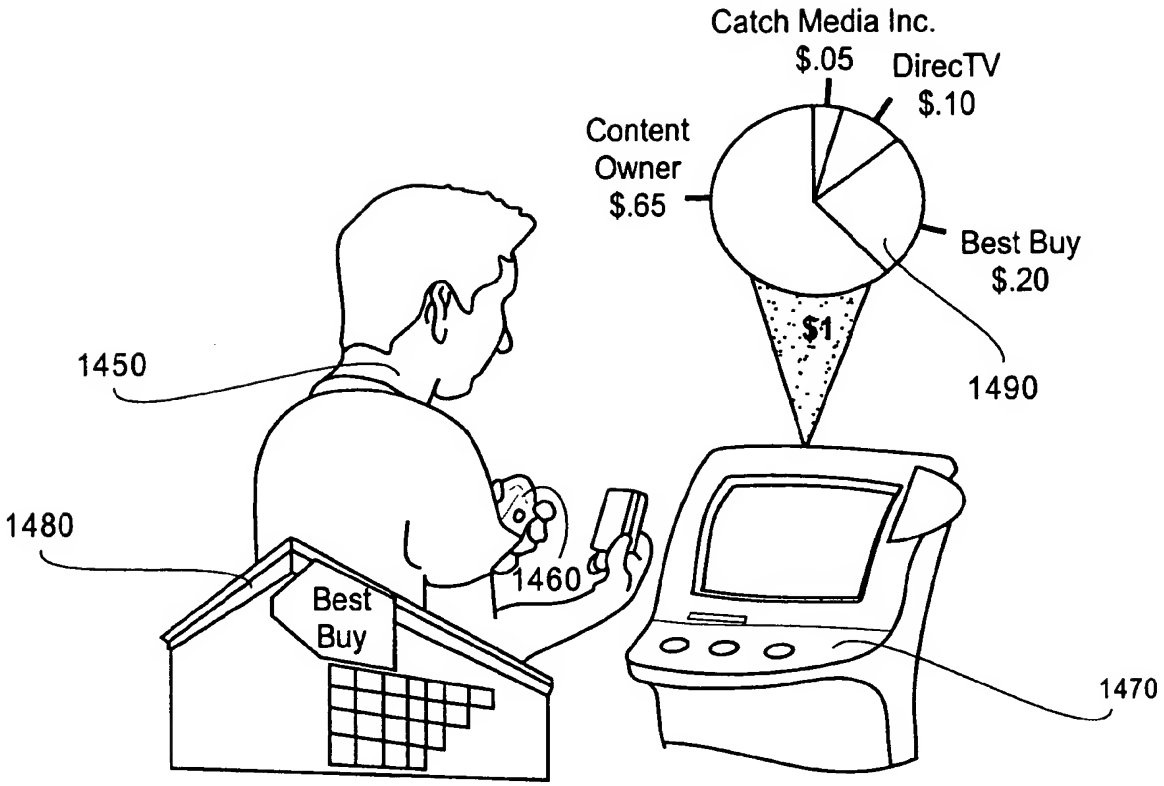
Catch Media Inc.
$.05
DirecTV
$.10
Content
Owner
$.65
Best Buy
$.20
$1
1450
1490
1480
1460
Best
Buy
1470

FIG. 14C

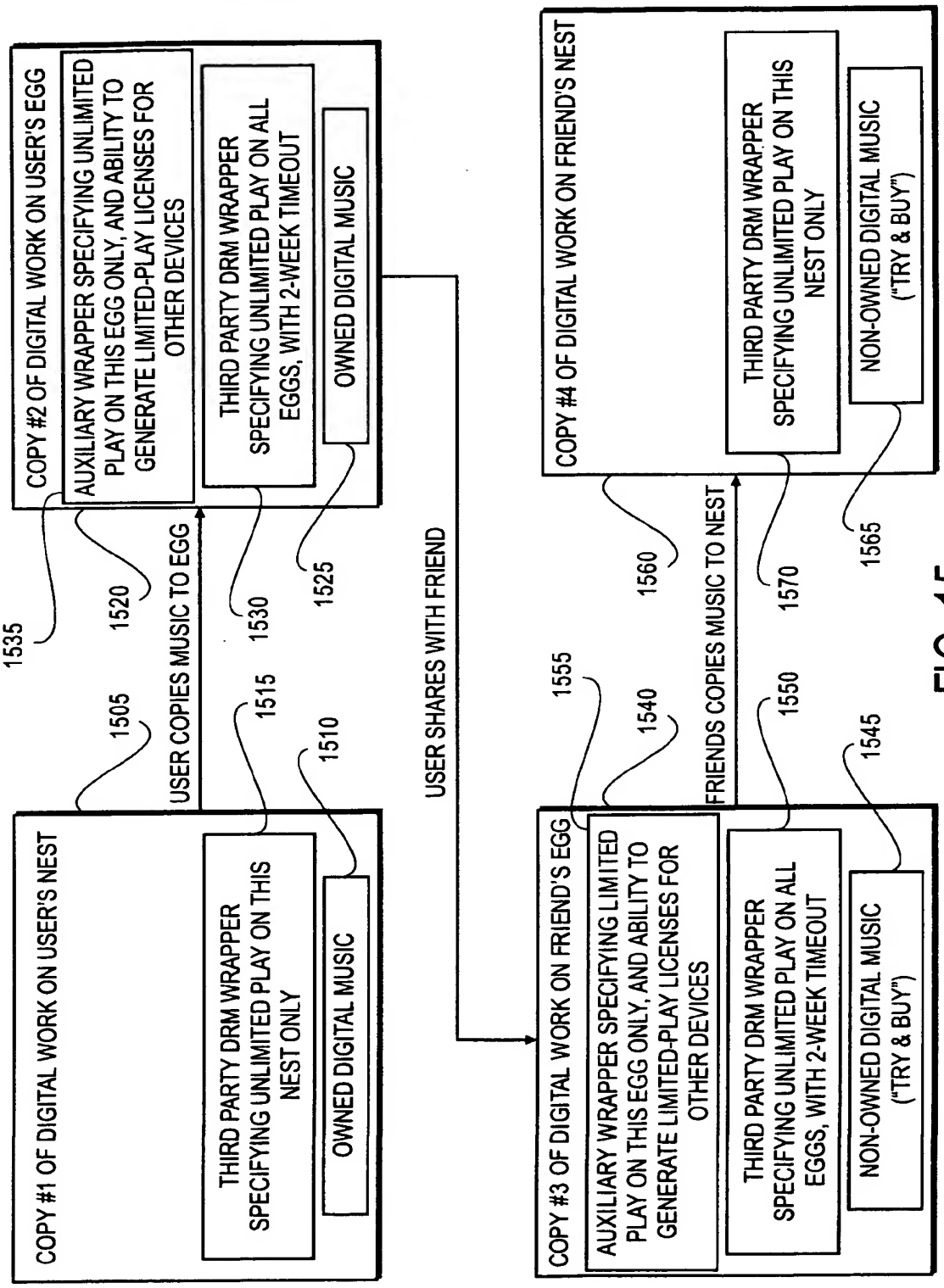
COPY #1 OF DIGITAL WORK ON USER'S NEST
THIRD PARTY DRM WRAPPER SPECIFYING UNLIMITED PLAY ON THIS NEST ONLY
OWNED DIGITAL MUSIC
COPY #2 OF DIGITAL WORK ON USER'S EGG
AUXILIARY WRAPPER SPECIFYING UNLIMITED PLAY ON THIS EGG ONLY, AND ABILITY TO GENERATE LIMITED-PLAY LICENSES FOR OTHER DEVICES
THIRD PARTY DRM WRAPPER SPECIFYING UNLIMITED PLAY ON ALL EGGS, WITH 2-WEEK TIMEOUT
OWNED DIGITAL MUSIC
USER COPIES MUSIC TO EGG
USER SHARES WITH FRIEND
COPY #3 OF DIGITAL WORK ON FRIEND'S EGG
AUXILIARY WRAPPER SPECIFYING LIMITED PLAY ON THIS EGG ONLY, AND ABILITY TO GENERATE LIMITED-PLAY LICENSES FOR OTHER DEVICES
THIRD PARTY DRM WRAPPER SPECIFYING UNLIMITED PLAY ON ALL EGGS, WITH 2-WEEK TIMEOUT
NON-OWNED DIGITAL MUSIC ("TRY & BUY")
FRIENDS COPIES MUSIC TO NEST
COPY #4 OF DIGITAL WORK ON FRIEND'S NEST
THIRD PARTY DRM WRAPPER SPECIFYING UNLIMITED PLAY ON THIS NEST ONLY
NON-OWNED DIGITAL MUSIC ("TRY & BUY")
1505
1510
1515
1520
1525
1530
1535
1540
1545
1550
1555
1560
1565
1570

FIG. 15

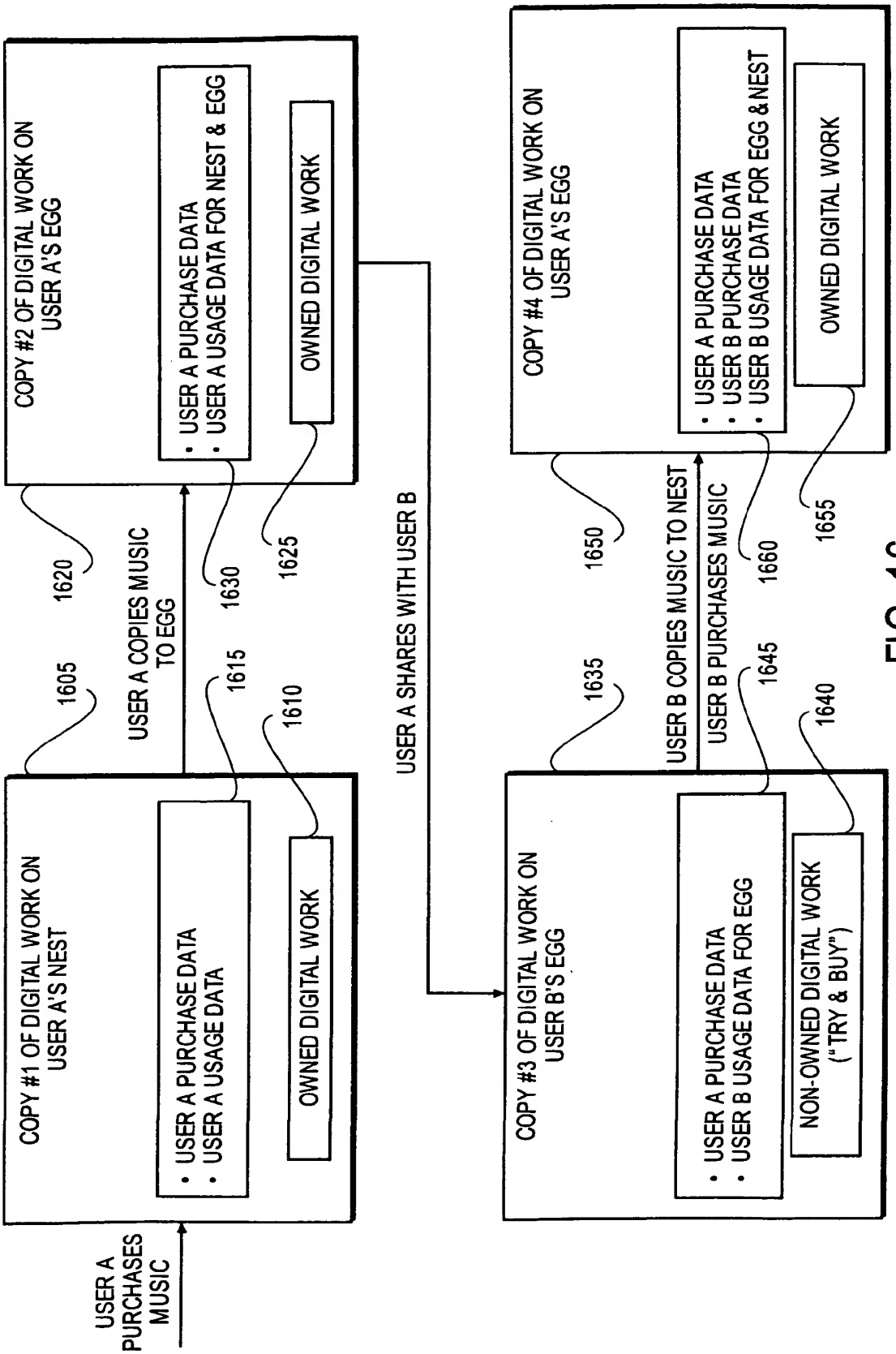
USER A PURCHASES MUSIC
COPY #1 OF DIGITAL WORK ON USER A'S NEST
• USER A PURCHASE DATA
• USER A USAGE DATA
OWNED DIGITAL WORK
1605
1610
1615
USER A COPIES MUSIC TO EGG
COPY #2 OF DIGITAL WORK ON USER A'S EGG
• USER A PURCHASE DATA
• USER A USAGE DATA FOR NEST & EGG
OWNED DIGITAL WORK
1620
1625
1630
USER A SHARES WITH USER B
COPY #3 OF DIGITAL WORK ON USER B'S EGG
• USER A PURCHASE DATA
• USER B USAGE DATA FOR EGG
NON-OWNED DIGITAL WORK ("TRY & BUY")
1635
1640
1645
USER B PURCHASES MUSIC
USER B COPIES MUSIC TO NEST
COPY #4 OF DIGITAL WORK ON USER A'S EGG
• USER A PURCHASE DATA
• USER B PURCHASE DATA
• USER B USAGE DATA FOR EGG & NEST
OWNED DIGITAL WORK
1650
1655
1660

FIG. 16

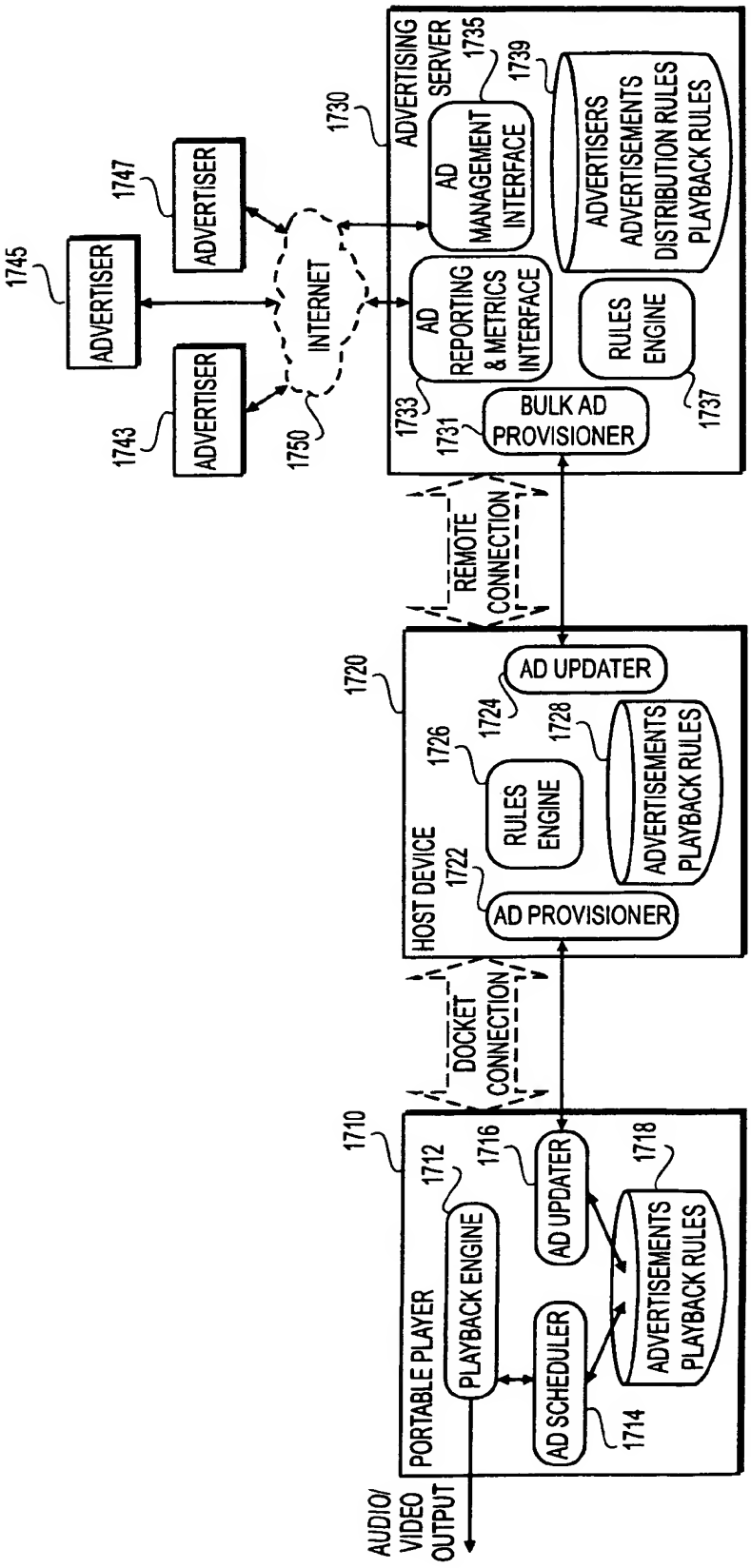
ADVERTISER
ADVERTISER
ADVERTISER
1745
1747
1743
1750
INTERNET
1730
ADVERTISING SERVER
1735
AD MANAGEMENT INTERFACE
1739
ADVERTISERS ADVERTISEMENTS DISTRIBUTION RULES PLAYBACK RULES
AD REPORTING & METRICS INTERFACE
RULES ENGINE
1733
1731
BULK AD PROVISIONER
1737
REMOTE CONNECTION
1720
HOST DEVICE
AD UPDATER
1724
1726
RULES ENGINE
1728
ADVERTISEMENTS PLAYBACK RULES
1722
AD PROVISIONER
DOCKET CONNECTION
1710
PORTABLE PLAYER
1712
PLAYBACK ENGINE
1716
AD UPDATER
1718
ADVERTISEMENTS PLAYBACK RULES
AD SCHEDULER
1714
AUDIO/ VIDEO OUTPUT

FIG. 17

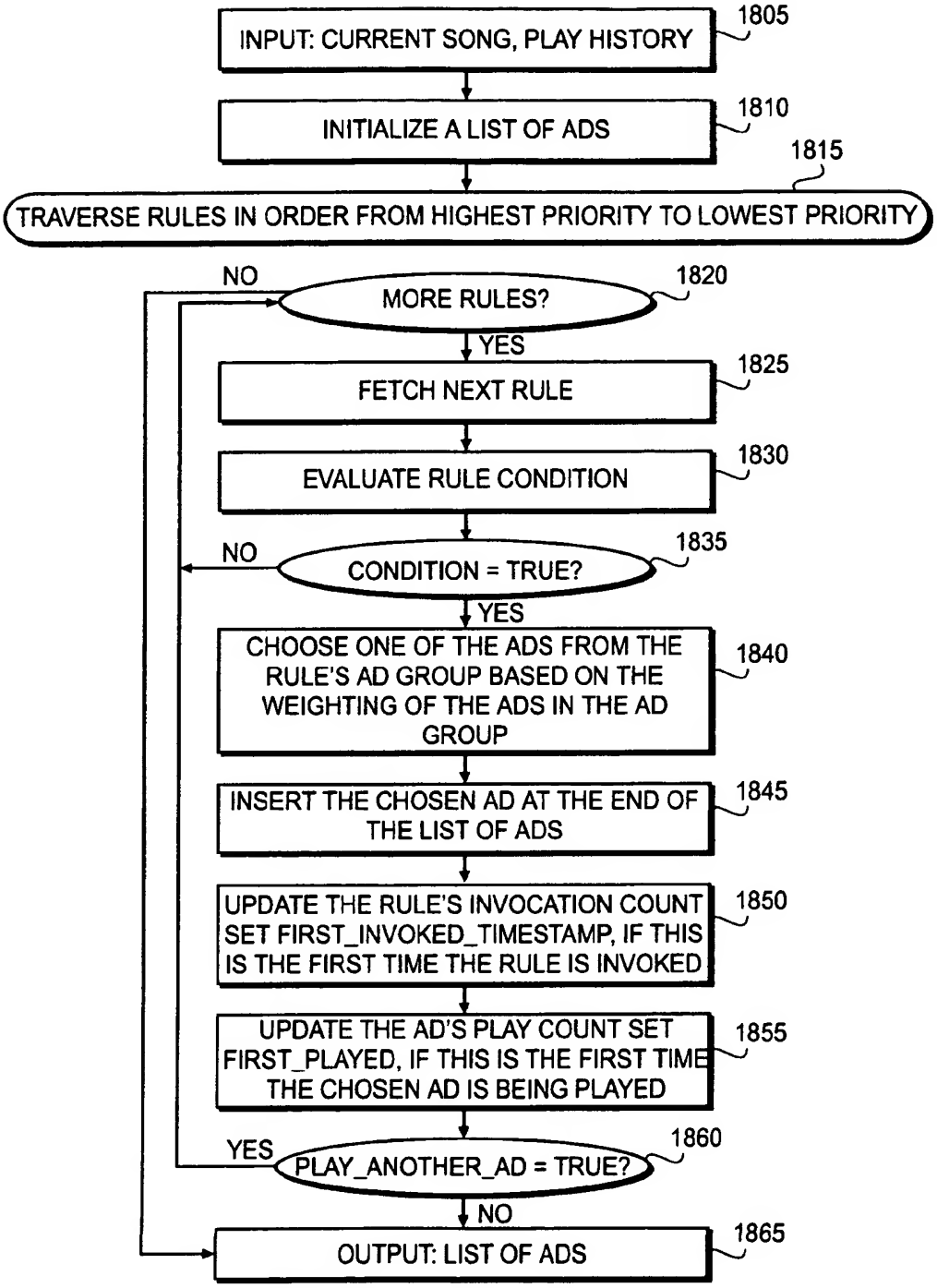
INPUT: CURRENT SONG, PLAY HISTORY
1805
INITIALIZE A LIST OF ADS
1810
1815
TRAVERSE RULES IN ORDER FROM HIGHEST PRIORITY TO LOWEST PRIORITY
NO
MORE RULES?
1820
YES
FETCH NEXT RULE
1825
EVALUATE RULE CONDITION
1830
NO
CONDITION = TRUE?
1835
YES
CHOOSE ONE OF THE ADS FROM THE RULE'S AD GROUP BASED ON THE WEIGHTING OF THE ADS IN THE AD GROUP
1840
INSERT THE CHOSEN AD AT THE END OF THE LIST OF ADS
1845
UPDATE THE RULE'S INVOCATION COUNT SET FIRST_INVOKED_TIMESTAMP, IF THIS IS THE FIRST TIME THE RULE IS INVOKED
1850
UPDATE THE AD'S PLAY COUNT SET FIRST_PLAYED, IF THIS IS THE FIRST TIME THE CHOSEN AD IS BEING PLAYED
1855
YES
PLAY_ANOTHER_AD = TRUE?
1860
NO
OUTPUT: LIST OF ADS
1865

FIG. 18